PROPERTY OF
L. F. BLANKENSHIP
3924 WELDE ST.
DENVER, COLORADO

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET #183

Ch. 120169-B

Emerson Ch. 120169-B is identical to Ch. 120164-B covered in Photofact folder 6 in set 183 except for the following changes:

A new Horizontal AFC Circuit is used in Ch. 120169-B. A partial schematic of this circuit is given on reverse side.

The following procedure should be followed to adjust the new circuit.

1. Turn the set on and tune in a TV station, preferably a test pattern.

2. Connect a short across the phasing coil L29. (The coil terminals are accessible from the top of the chassis on a terminal strip located near V17 as shown below.)

3. Short the Horizontal Control Grid to chassis. (This point has been brought to the terminal strip on the top of chassis also.)

4. Rotate the Horizontal Hold Control to the center of its mechanical range.

5. Adjust the Horizontal Balance control until picture synchronizes.

6. Remove short from the Horizontal Phase Coil (L29) and adjust Horizontal Phasing slug (B2) until picture synchronizes.

7. Remove short from Horizontal control grid.

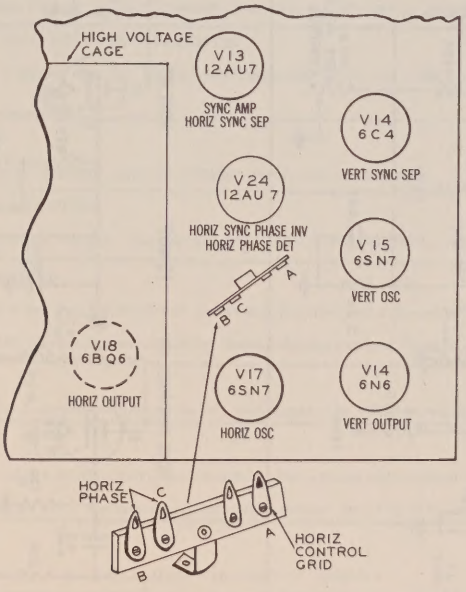
8. Remove signal by switching to another channel and back. If picture is out of sync adjust B2 until picture locks into sync.

9. Check other channels as in step 8, readjusting B2 if necessary until sync holds for each channel.

The two triode sections of V15 were reversed.

The two 40MFD sections of C1 were consolidated into one 80MFD unit and C1B in the above circuit was included in this unit.

A video test point was added on the top of the chassis. This connects to the junction of L25, R38 and L22.



(Continued on reverse side)

PROPERTY OF
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3324 MEADE ST.
DENVER, COLORADO

Emerson Models: 711F, 712F, 720D, 732B, 734B (Ch. 120169-B)

PRODUCTION CHANGES
BULLETIN 56

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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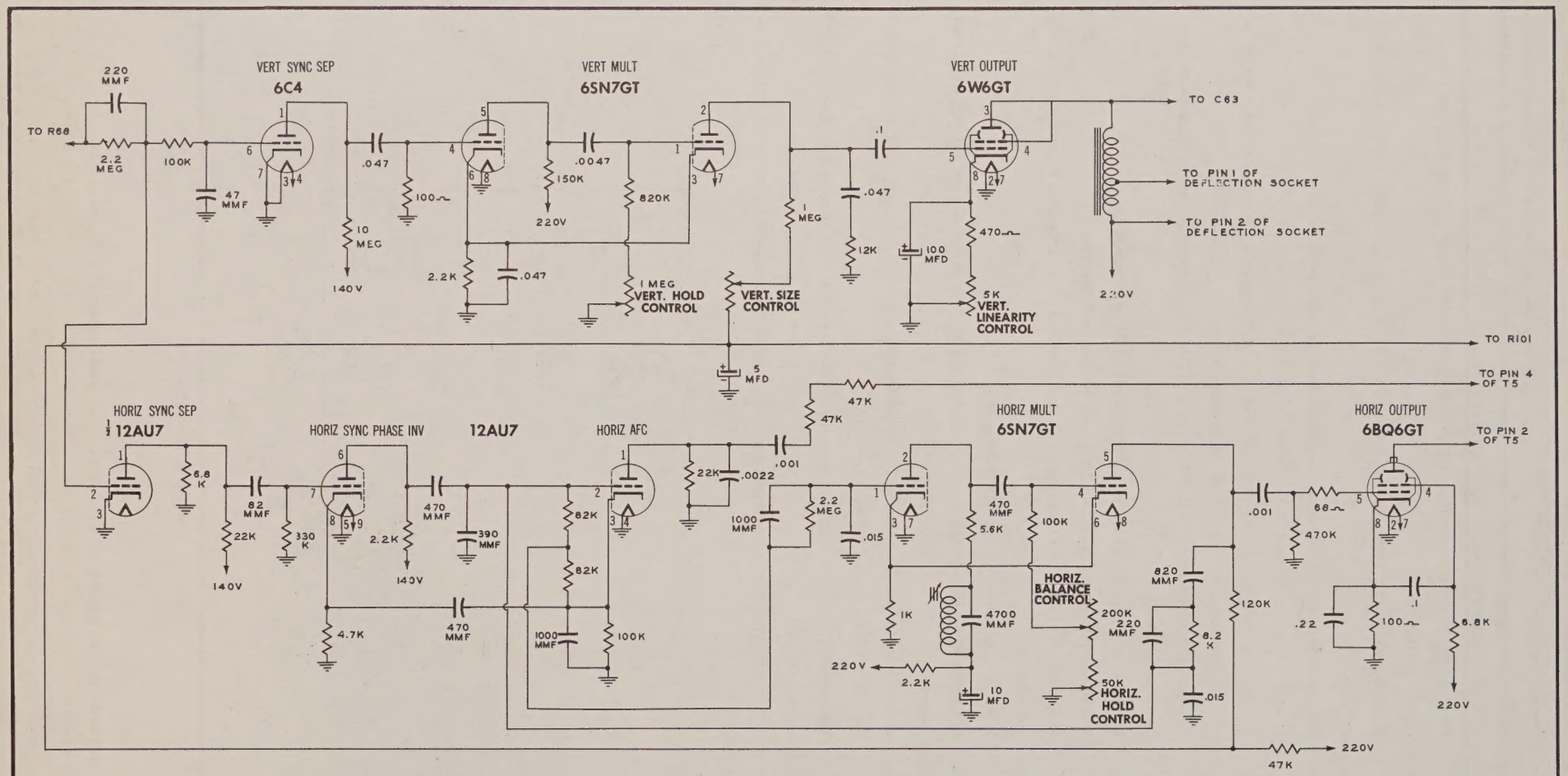

Emerson Models: 71IF, 712F, 720D, 732B, 734B (Ch. 120169-B)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 8 IN SET #157		
Ch. KCS68C, KCS68E	The following changes were made in later production of RCA Ch. KCS68C and Ch. KCS68E. The 6800Ω resistor on which L32 (500 Microhenries Video Peaking Coil) was wound has been removed. The new coil is coded with a green and a white dot (Part #75252). L34 was changed to a 500 Microhenries coil coded with a green and a white dot (Part #75253). R146, the high voltage bleeder was omitted. R91 was changed to 27KΩ. A 1KΩ resistor was added across L23. C34 changed to 5-70MMF trimmer capacitor (Part #71496). The On/Off switch on the volume control has been changed to a DPST switch. The bottom of the brightness control has been removed from ground and connected to the added pole. When the switch is closed the bottom of the brightness control is returned to ground as before. When the switch is open the bottom of the brightness control is left open. (Continued on reverse side)	RCA Models: 21T159, 21T165 (Ch. KCS68E) 21T176, 21T177, 21T178, 21T179 (Ch. KCS68C)

PROPERTY OF

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 171		
	Philco Models 52-T2106, 52-T2108, 52-T2110, 52-T2140 and 52-T2144, Code 121 using RF-IF Chassis 41 and Sweep Chassis D-1, A were covered in Photofact Folder 9 in Set 171. Several more Models have been added to this group and are electrically identical to the models covered in this folder. The added models are 52-T1820, 52-T1850 (Use 17JP4 Picture Tube), 52-T2120, 52-T2122, L, 52-T2151, 52-T2224 52-2252, 52-T2254, 52-T2256, 52-T2258 and 52-T2259. Later Production Changes are as follows.	Philco Models: 52-T1820, 52-T1850, 52-T2106, 52-T2108, 52-T2110, 52-T2120, 52-T2122, L, 52-T2140, 52-T2144, 52-T2151, 52-T2224, 52-T2252, 52-T2254, 52-T2256, 52-T2258, 52-T2259 (Code 121) (Ch. 41, D-1, A).
RF Ch. 41 Run 1 thru Run 4 Defl. Ch. D-1 Run 1 and 2	Production changes in RF-IF Chassis 41 Runs 1 thru 4 and Deflection Chassis D-1 Runs 1 and 2 are covered in Photofact Folder 9 in Set 171.	
RF Ch. 41 Run 5	TO ELIMINATE PICTURE WASHOUT R127, B± dropping resistor, changed to 1500Ω, 12 watts.	
RF Ch. 41 R6	TO CENTER THE RANGE OF THE VARIABLE PEAKING COIL L30, 1st. Video Amp. Shunt Peaking Coil, changed from 220 microhenries to 180 microhenries. C58, 1st. Video Amp. Cathode Bypass Capacitor changed from .0047MF to .0033MF.	
RF Ch. 41 Run 9	TO PROVIDE FOR VERTICAL RETRACE SUPPRESSION A lead was added from pin 10 of the chassis interconnecting cable plug to the picture tube cathode (pin 11).	
RF Ch. 41 Run 10	COMPONENT CHANGE C69 was changed from 390MMF, mica to 330MMF ceramic type capacitor.	
RF Ch. 41 Run 11	TO IMPROVE PICTURE TUBE CUTOFF R59, picture tube cathode resistor, was changed from 82KΩ, $\frac{1}{2}$ watt, to 68KΩ, 1 watt.	
Defl. Ch.D-1A Run 3	DEFLECTION SOCKET REWIRED The wire connected to pin 9 of the deflection socket was removed and a jumper added from pin 9 to pin 10 of the socket. When this change was made the chassis designation was changed to D-1A.	
Defl. Ch.D-1A Run 4	TO INCREASE WIDTH R118, horizontal-output screen dropping resistor, was changed to 5100Ω, 5 watts.	
Defl. Ch. D-1A Run 5	COMPONENT CHANGE L35, horizontal oscillator transformer, was changed. This change was covered in Photofact Folder 9 in Set 171. For earlier runs horizontal oscillator transformer part #32-8517.was used.	
Defl. Ch. D-1A Run 6	TO IMPROVE TONE C74, Tone Compensation Capacitor, changed from .01MF to .0068MF.	
Defl. Ch. D-1A Run 7	TO PREVENT PARASITIC OSCILLATION A 330Ω resistor was added in series with the grid of the vertical output tube V15 (6BG6GT).	
Defl. Ch. D-1A Run 8	TO ELIMINATE VERTICAL OUTPUT TRANSFORMER BUZZ R100 was removed and reconnected across the secondary of the vertical output ransformer T4. When this change is made C87 is returned directly to ground.	

(Continued on reverse side)

	In some sets a 5MFD capacitor was connected between the top of the brightness control and ground. In some sets the resistor included in the Detector Assembly (M5) may be any value from 5600Ω to 10KΩ. A 220Ω resistor is added in series with the lead between pin 6 of the 6AG7 Video Amplifier (V7) and C3D. The .25 amp. fuse (M1) has been replaced by a .2 amp. Slo-Blo type fuse. C1115 and C116 is returned to the unfused side of the 370V. line and C121 has been omitted. Later production used a tuner which is marked M1. The following changes were made in this unit. C22 is changed to 470MMF. C27 is changed to .8 to 3MMF trimmer . C26 is changed to 10MMF. L18 is changed to a straight wire. Point F has been moved to the junction of L17 and L18.	RCA Models: 21T159, 21T165 (Ch. KCS68E) 21T176, 21T177, 21T178, 21T179 (Ch. KCS68C)

Defl. Ch. D-1A Run 9	TO IMPROVE HORIZONTAL SYNC PERFORMANCE C95, horizontal oscillation grid blocking capacitor, was reconnected between the green lead of the horizontal oscillation transformer and pin 4 (grid) of V16. The white lead is connected directly to ground when this change is made.	Philco Models: 52-T1820, 52-T1850, 52-T2106, 52-T2108, 52-T2110, 52-T2120, 52-T2122, L, 52-T2140, 52-T2144, 52-T2151, 52-T2224, 52-T2252, 52-T2254, 52-T2256, 52-T2258, 52-T2259 (Code 121) (Ch. 41, D-1, A)
Defl. Ch. D-1A Run 10	TO PROVIDE FOR VERTICAL RETRACE SUPPRESSION A .022MF capacitor was added from Pin 11 of the yoke socket to pin 10 of the chassis interconnecting socket.	
Defl. Ch. D-1A Run 11	COMPONENT CHANGE R126 changed from 7.5Ω, 15 watts, to 5Ω, 160 watts.	
Defl. Ch. D-1A Run 12	TO IMPROVE HORIZONTAL OSCILLATOR PERFORMANCE AND RECENTER HORIZONTAL OSCILLATOR FREQUENCY CONTROL R110 changed from 390KΩ to 330KΩ. C95 changed from 270MMF to 390MMF.	
Defl. Ch. D-1A Run 13	TO ELIMINATE PICKUP FROM AC LEADS The Horizontal Lock Trimmer capacitor was moved from the rear to the side of the chassis.	

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The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

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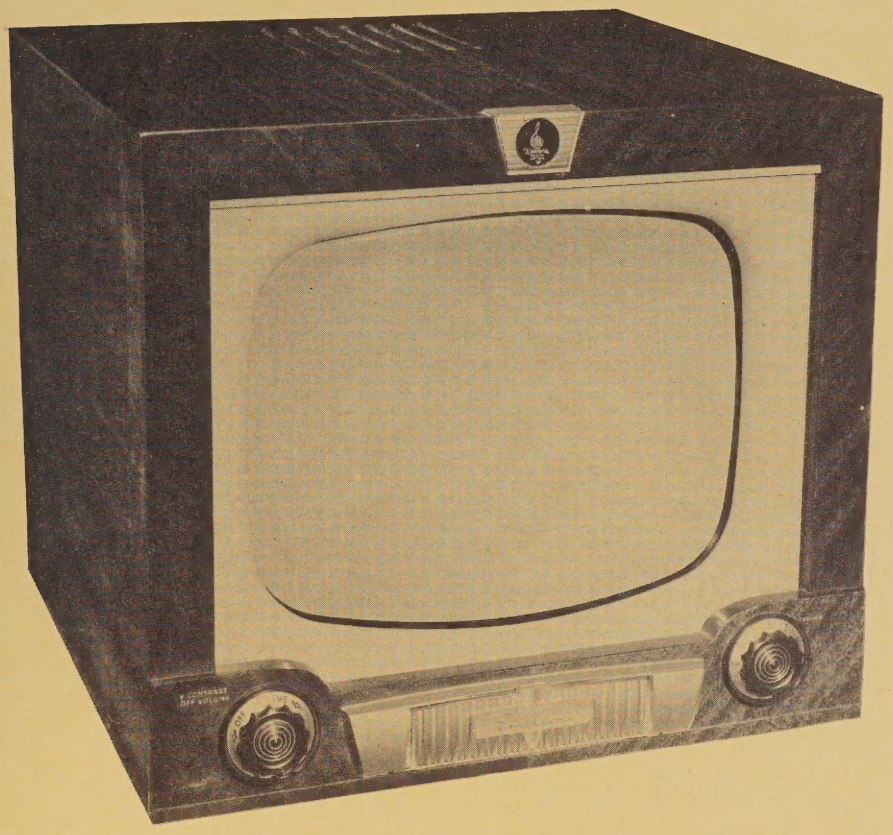

MODEL 716D

EMERSON MODELS
716D, 717D, 719D, 722D (Ch. 120163-D)

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EMERSON MODELS
716D, 717D, 719D, 722D (Ch. 120163-D)

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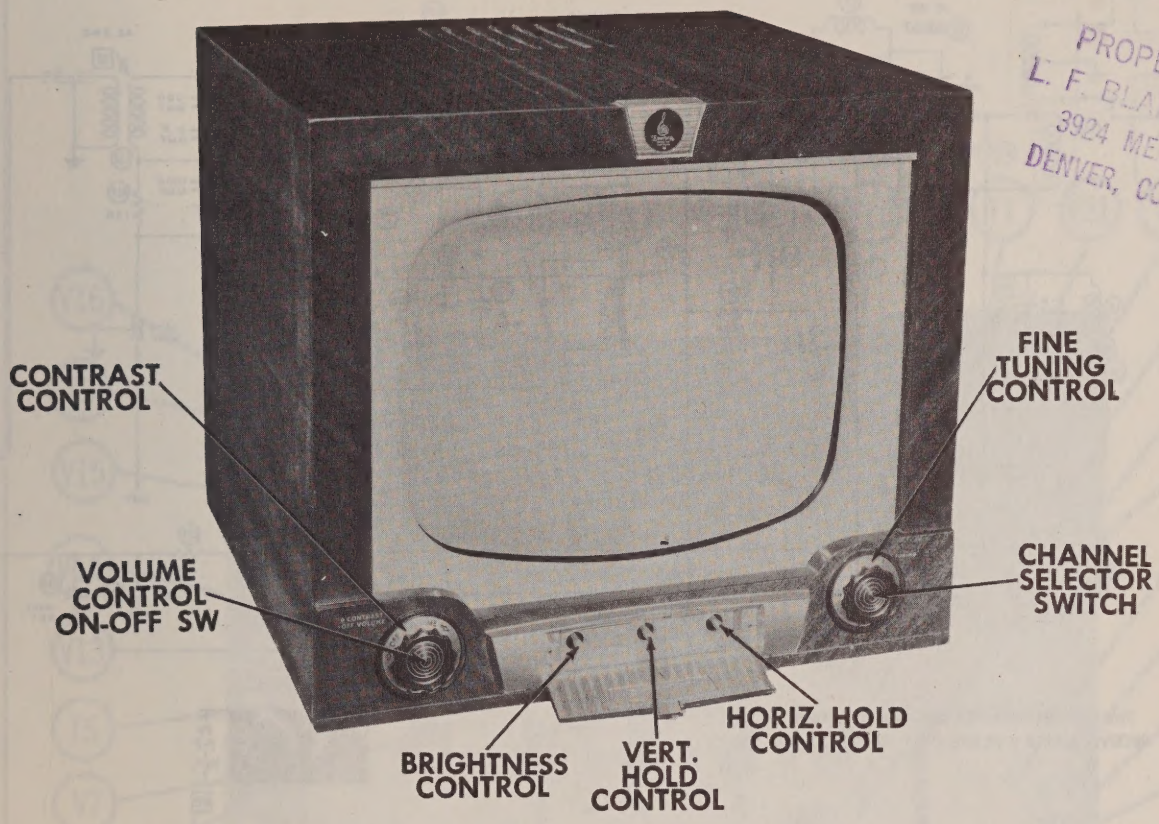

EMERSON MODEL 716D (Ch. 120163-D)

TRADE NAME	Emerson Models 716D, 717D, 719D, 722D (Ch. 120163-D)
MANUFACTURER	Emerson Radio & Phono Corp., 111 8th. St., New York, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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EMERSON MODELS
716D, 717D, 719D, 722D (Ch. 120163-D)

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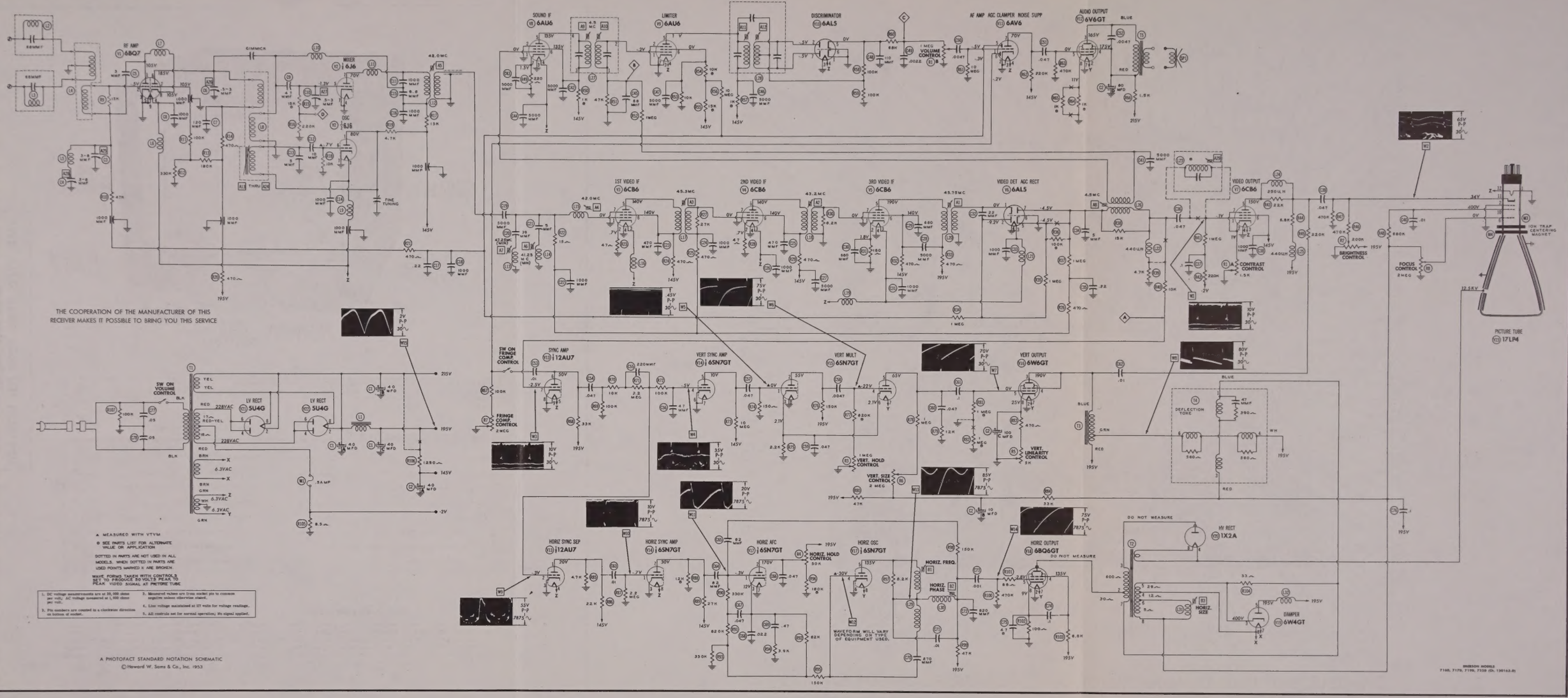
RF AMP V1 6BQ7
MIXER V2 6J6
OSC V3 6J6
GIMMICK
42.0MC
SOUND IF V8 6AU6
LIMITER V9 6AU6
DISCRIMINATOR V10 6AL5
AF AMP AGC CLAMPER NOISE SUPP V11 6AV6
AUDIO OUTPUT V12 6V6GT
VOLUME CONTROL
1ST VIDEO IF V2 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO DET AGC RECT V6 6AL5
VIDEO OUTPUT V7 6CB6
CONTRAST CONTROL
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
PICTURE TUBE V17 17LP4
SW ON VOLUME CONTROL
LV RECT V21 5U4G
LV RECT V22 5U4G
SW ON FRINGE COMP. CONTROL
SYNC AMP V13 12AU7
VERT SYNC AMP V14 6SN7GT
VERT MULT V15 6SN7GT
VERT OUTPUT V16 6W6GT
FRINGE COMP. CONTROL
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT. LINEARITY CONTROL
DEFLECTION YOKE
HORIZ SYNC SEP V12 12AU7
HORIZ SYNC AMP V18 6SN7GT
HORIZ AFC V17 6SN7GT
HORIZ OSC V17 6SN7GT
HORIZ. HOLD CONTROL
HORIZ. FREQ.
HORIZ. PHASE
HORIZ OUTPUT V18 6BQ6GT
DO NOT MEASURE
HV RECT V20 1X2A
HORIZ. SIZE
DAMPER V19 6W4GT
WAVEFORM WILL VARY DEPENDING ON TYPE OF EQUIPMENT USED.
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK VIDEO SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated.
3. Pin numbers are counted in a clockwise direction on bottom of socket.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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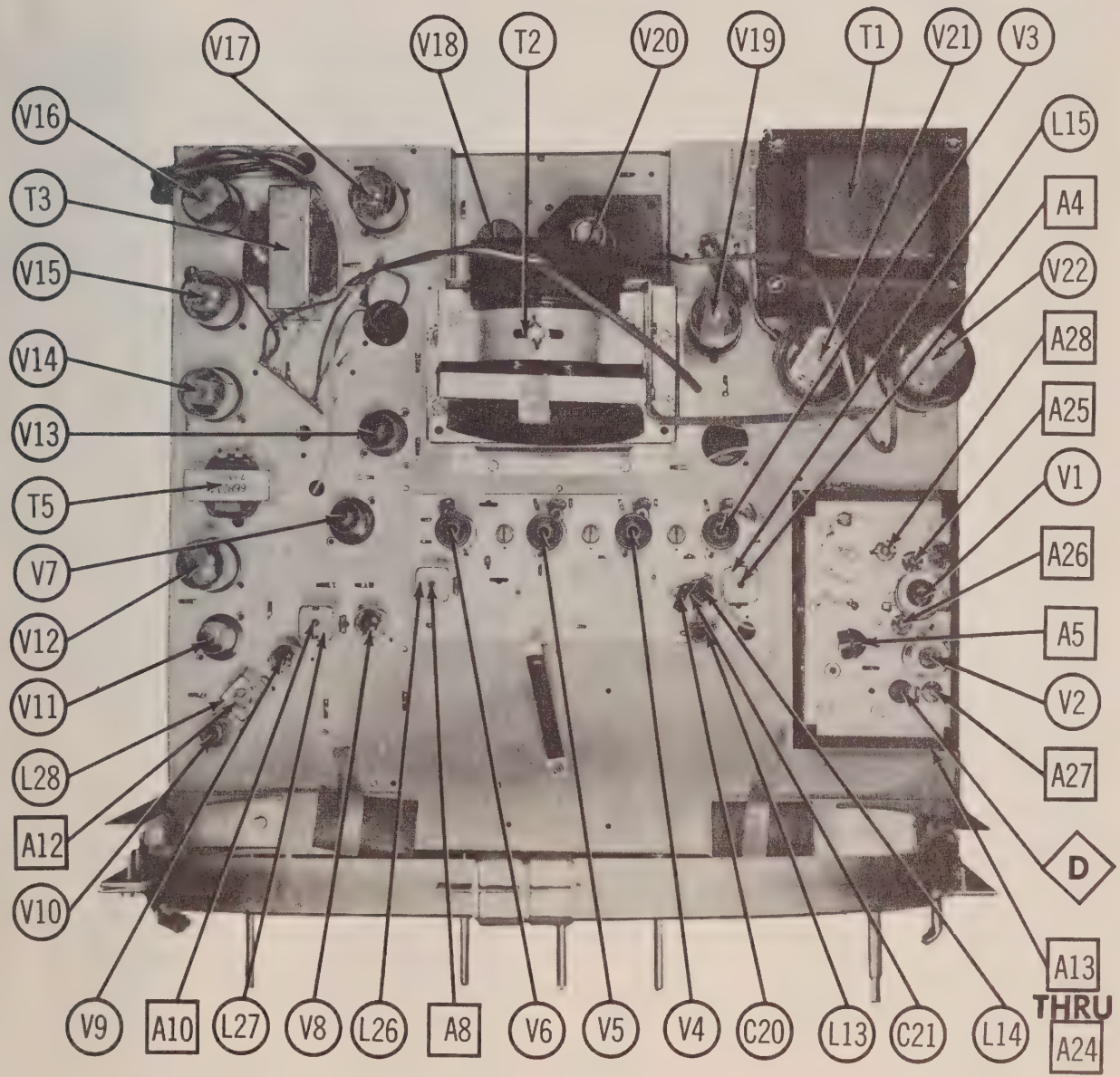
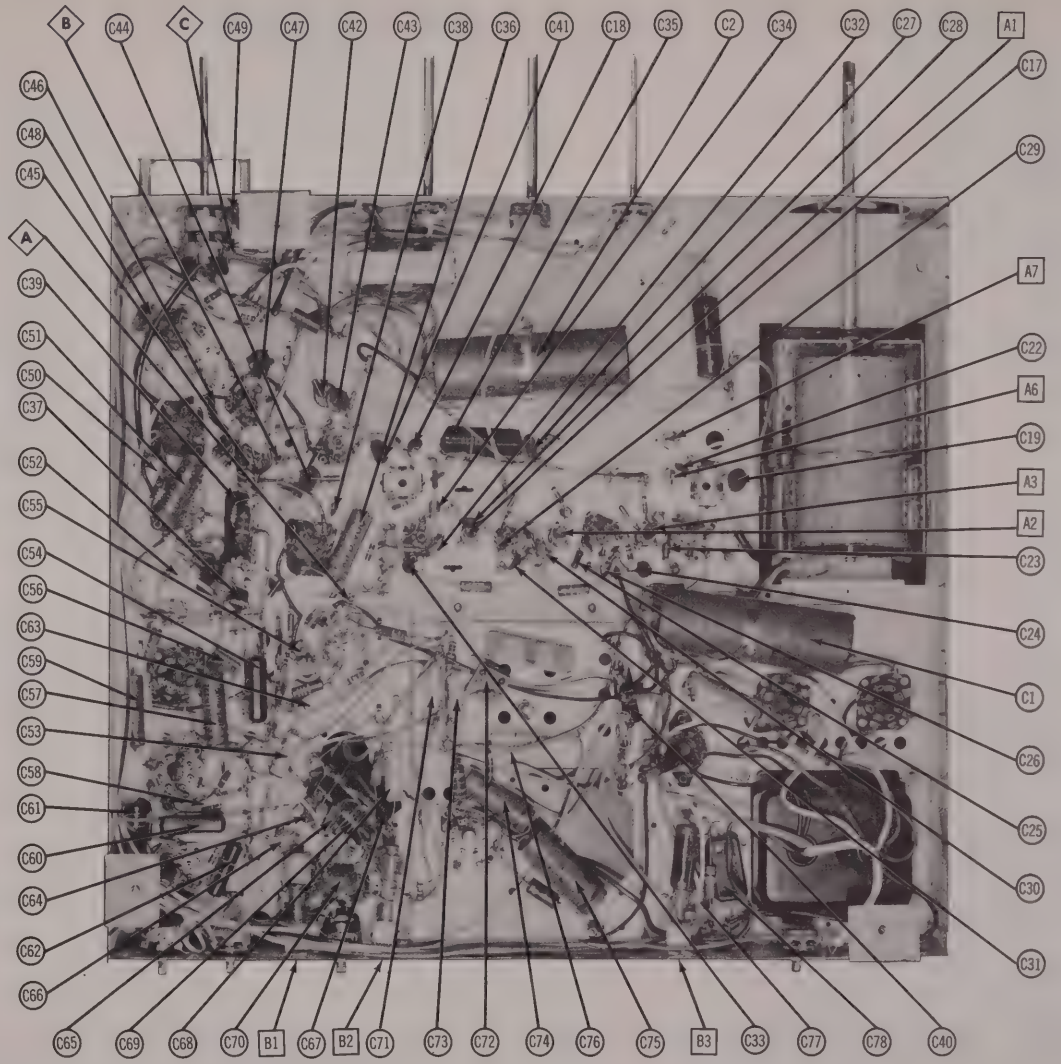
EMERSON MODELS 716B, 717B, 719B, 722B (Ch. 120163-B)

716D, 717D, 719D, 722D (Ch. 120163-D)

EMERSON MODELS

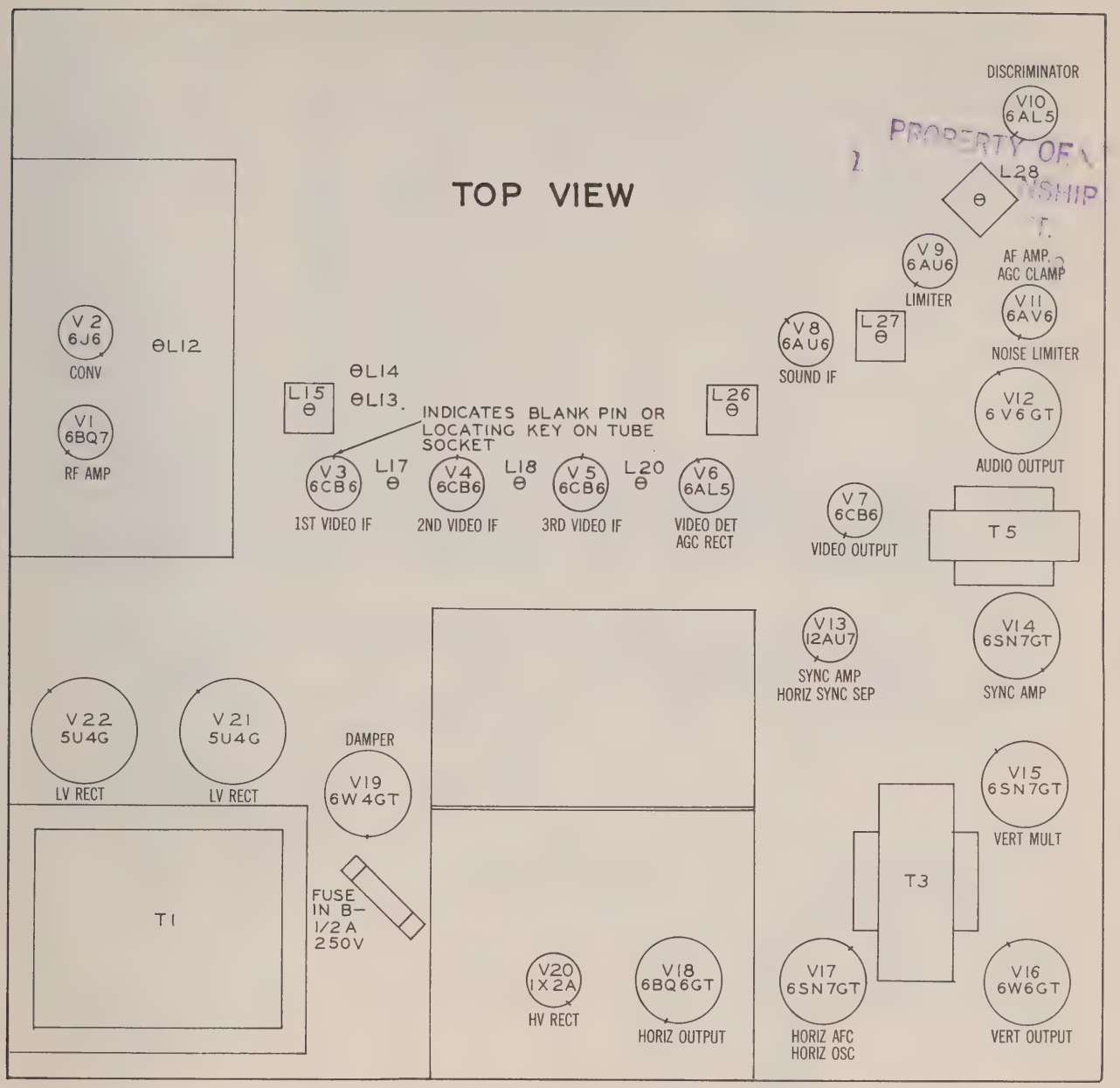


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster no sound-V21, V22 Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V7, V23
Has pic, no sound-V8, V9, V10, V11, V12
Overloaded picture-V6

SYNC FAILURE
No vert. sync-V13, V14, V15
No horiz. sync-V13, V14, V17
No vert. or horiz. sync-V13

SWEEP FAILURE
No raster, has sound-V17, V18, V19, V20, V23
No vertical deflection-V16
Poor vert. linearity or foldover-V15, V16
Poor horiz. linearity or foldover-V17, V18, V19
Narrow picture-V17, V18, V19, V20, V21, V22
Vert. off freq. -V14, V15
Horiz. off freq. -V13, V14, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube (V17).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C35. Connect the positive lead to chassis.
Chassis coded ⟨C⟩ or later require that L12, L15 and L17 be aligned to different frequencies than in previous chassis. Alignment frequencies for sets coded ⟨C⟩ or later are indicated in the table by an asterisk (*).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	45.74MC (Unmod)	Any	DC probe to point ⟨A⟩ Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	43.2MC	"	"	A2	"
3.	"	"	45.3MC *42.0MC	"	"	A3	"
4.	"	"	42.0MC *45.0MC	"	"	A4, A5	"
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
6.	"	"	47.25MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	Any	Vert. amp to point ⟨A⟩ Low side to chassis.		Check for response similar to fig. 1. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to point ⟨A⟩ Low side to chassis.	Not used.	4.5MC (Unmod)	Any	Use VTVM. DC probe to point ⟨B⟩ Common to chassis.	A8, A9, A10	Adjust for maximum deflection.
9.	"	"	4.5MC (450KC Swp)	4.5MC	"	Vert. amp of scope thru 10KΩ to point ⟨C⟩ Low side to chassis.	A11, A12	Adjust A11 for maximum amplitude and straightness of crossover lines as in fig. 2. Adjust A12 so that 4.5MC occurs at center of crossover lines. SLIGNTLY retouch A11 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Remove the dummy converter tube and replace the original 6J6 in its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna leads with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point ⟨A⟩ Low side to chassis.	A13	Advance gain of vertical amplifier of scope so that sound trap notch in visable. Adjust to place sound marker in trap notch. Video marker should be between 30% and 40% of response on high frequence side of curve as in fig. 3.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC	55.25MC 59.75MC	2		A24	

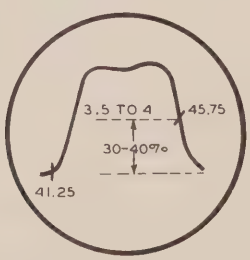


FIG. 1

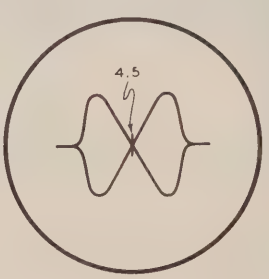


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp thru 10KΩ to point (D) Low side to chassis.	A25, A26, A27	Adjust for response curve of maximum amplitude and band width as in fig. 4.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to fig. 4. If markers fall below 70% on any channel make slight compromise adjustments of A25, A26 and A27 with channel switch turned to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF TRAP ALIGNMENT

A trap is provided in the input section of the tuner for the purpose of reducing interference on Channel 2 from transmitters operating in the 40MC band. If such interference is noted adjust A28 to minimize it.

4.5MC TRAP ALIGNMENT

Chassis coded (D) or later incorporate a 4.5MC trap, mounted near V7. To adjust tune to a TV test pattern and adjust A29 for maximum vertical wedge definition.

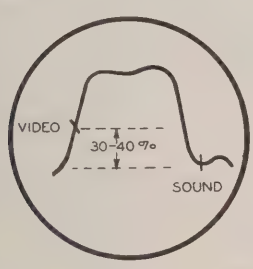


FIG. 3

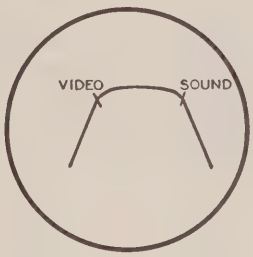
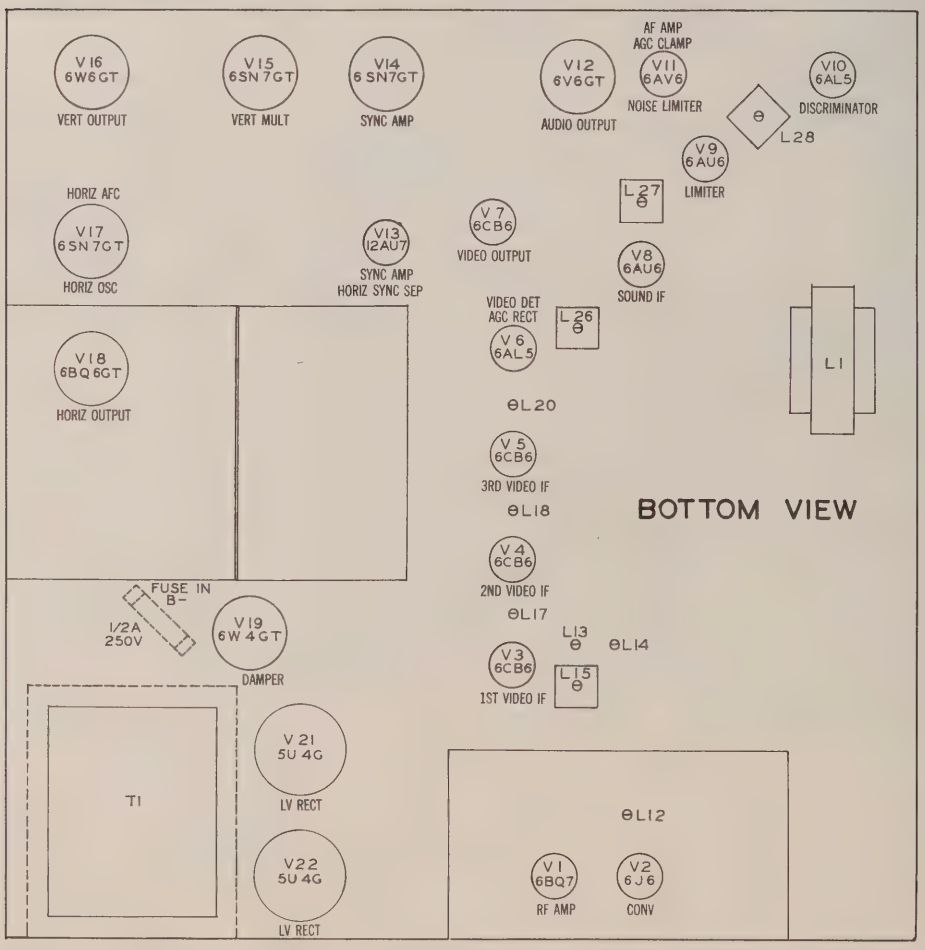


FIG. 4

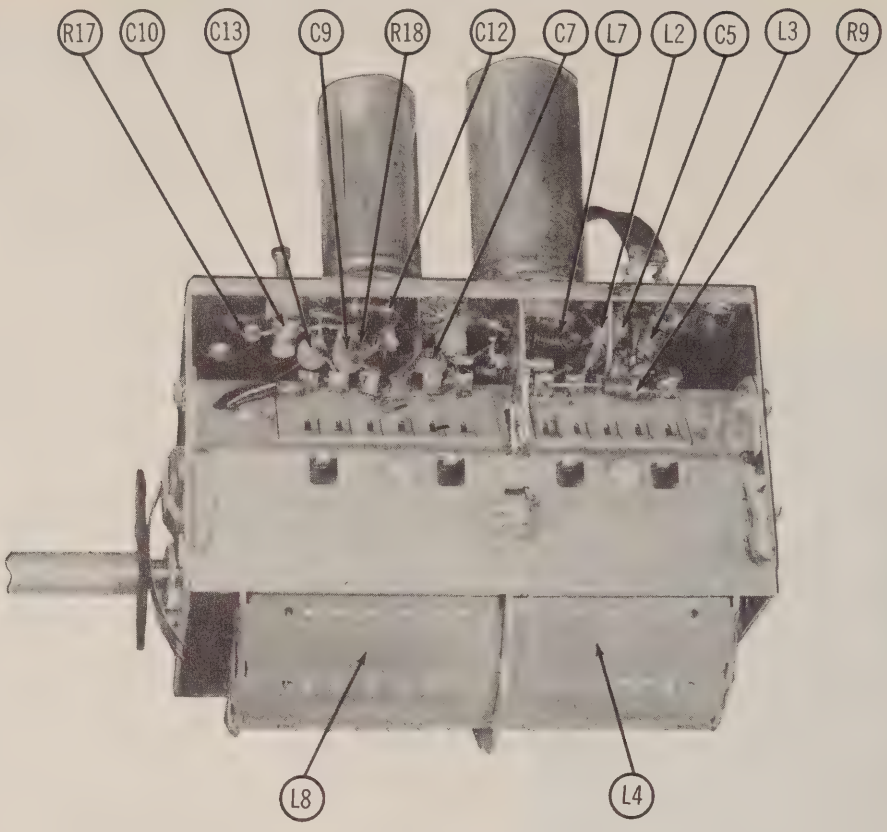
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	1.8Meg	0Ω	.1Ω	0Ω	†1.1KΩ	225KΩ	INF	0Ω
V 2	6J6	†6KΩ	†16KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	1 Meg	47Ω	.1Ω	0Ω	†1.8KΩ	†1.8KΩ	0Ω		
V 4	6CB6	1 Meg	47Ω	.1Ω	0Ω	†1.8KΩ	†1.8KΩ	0Ω		
V 5	6CB6	0Ω	180Ω	.1Ω	0Ω	†550Ω	†1.8KΩ	0Ω		
V 6	6AL5	0Ω	1.1Meg	.1Ω	0Ω	100KΩ	0Ω	4.7KΩ		
V 7	6CB6	1.2Meg	160Ω	.1Ω	0Ω	†6.9KΩ	†1.3KΩ	160Ω		
V 8	6AU6	1 Meg	0Ω	0Ω	.1Ω	†2.3KΩ	†2.3KΩ	220Ω		
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†2.3KΩ	7.7KΩ	0Ω		
V 10	6AL5	0Ω	100KΩ	0Ω	.1Ω	200KΩ	0Ω	100KΩ		
V 11	6AV6	10 Meg	0Ω	0Ω	.1Ω	1.8Meg	1.2Meg	†220KΩ		
V 12	6V6GT	INF	.1Ω	†1.8KΩ	†1.5KΩ	470KΩ	50Ω	0Ω	500Ω	
V 13	12AU7	3.9KΩ	2.3Meg	0Ω	.1Ω	.1Ω	†33KΩ	15KΩ	0Ω	0Ω
V 14	6SN7GT	2.2Meg	9.6KΩ	0Ω	2.4Meg	†10 Meg	0Ω	0Ω	.1Ω	
V 15	6SN7GT	150Ω	†150KΩ	2.2KΩ	1.2Meg	#2.1Meg	2.2KΩ	.1Ω	0Ω	
V 16	6W6GT	INF	0Ω	†373Ω	†373Ω	2 Meg	1.3Meg	.1Ω	1.4KΩ	
V 17	6SN7GT	1.5Meg	†23KΩ	412KΩ	480KΩ	†47KΩ	0Ω	0Ω	.1Ω	
V 18	6BQ6GT	INF	0Ω	INF	†6.8KΩ	470KΩ	INF	.1Ω	100Ω	Top Cap #63Ω
V 19	6W4GT	INF	INF	†80KΩ	INF	†83Ω	INF	#29Ω	#29Ω	
V 20	1X2A	PINS 1 - 9 HAVE INF RESISTANCE								Top Cap #663Ω
V 21	5U4G	INF	9.4KΩ	INF	16.5KΩ	8.5Ω	16.5Ω	INF	9.4KΩ	
V 22	5U4G	INF	9.4KΩ	INF	16Ω	INF	16Ω	INF	9.4KΩ	
V 23	17LP4	0Ω	0Ω	Pin 6 40Ω	Pin 10 #680KΩ	Pin 11 245KΩ	Pin 12 .1Ω			

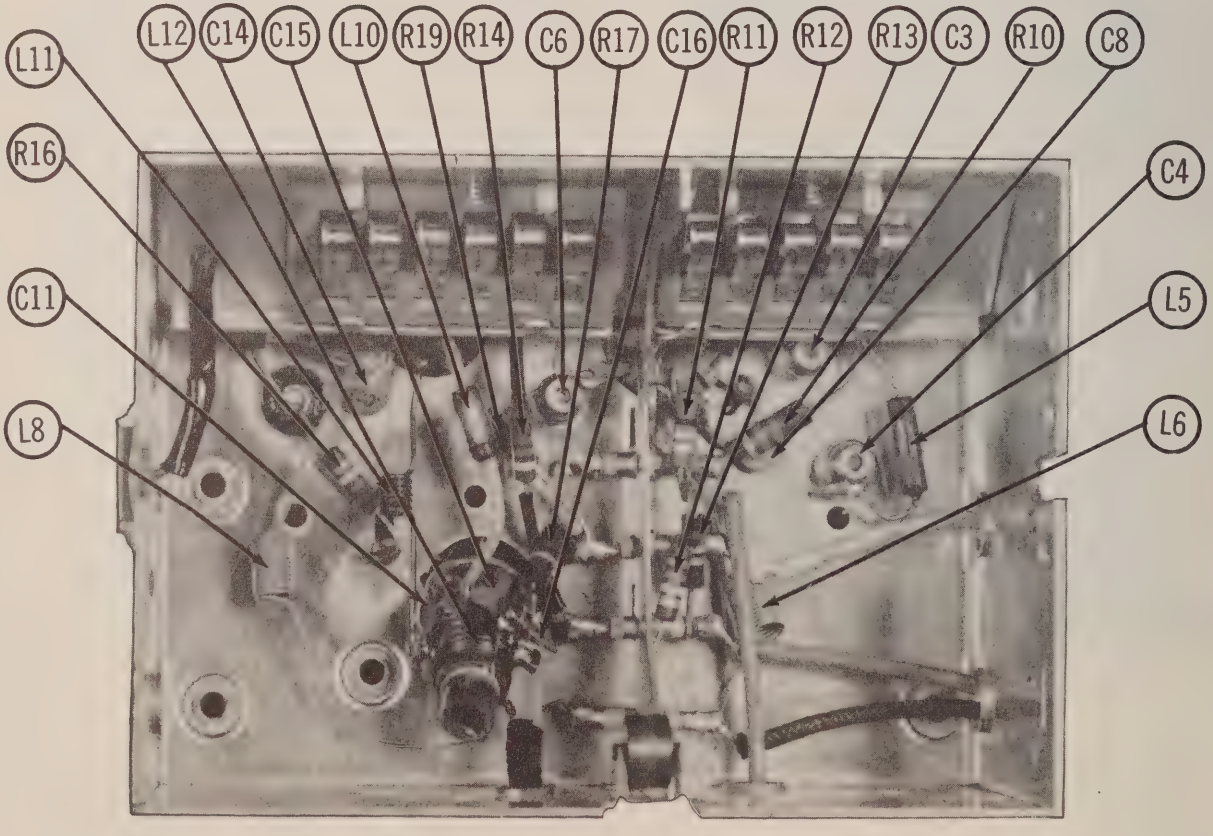
† MEASURED FROM PINS 8 OF V21 & V22
# MEASURED FROM PIN 3 OF V19



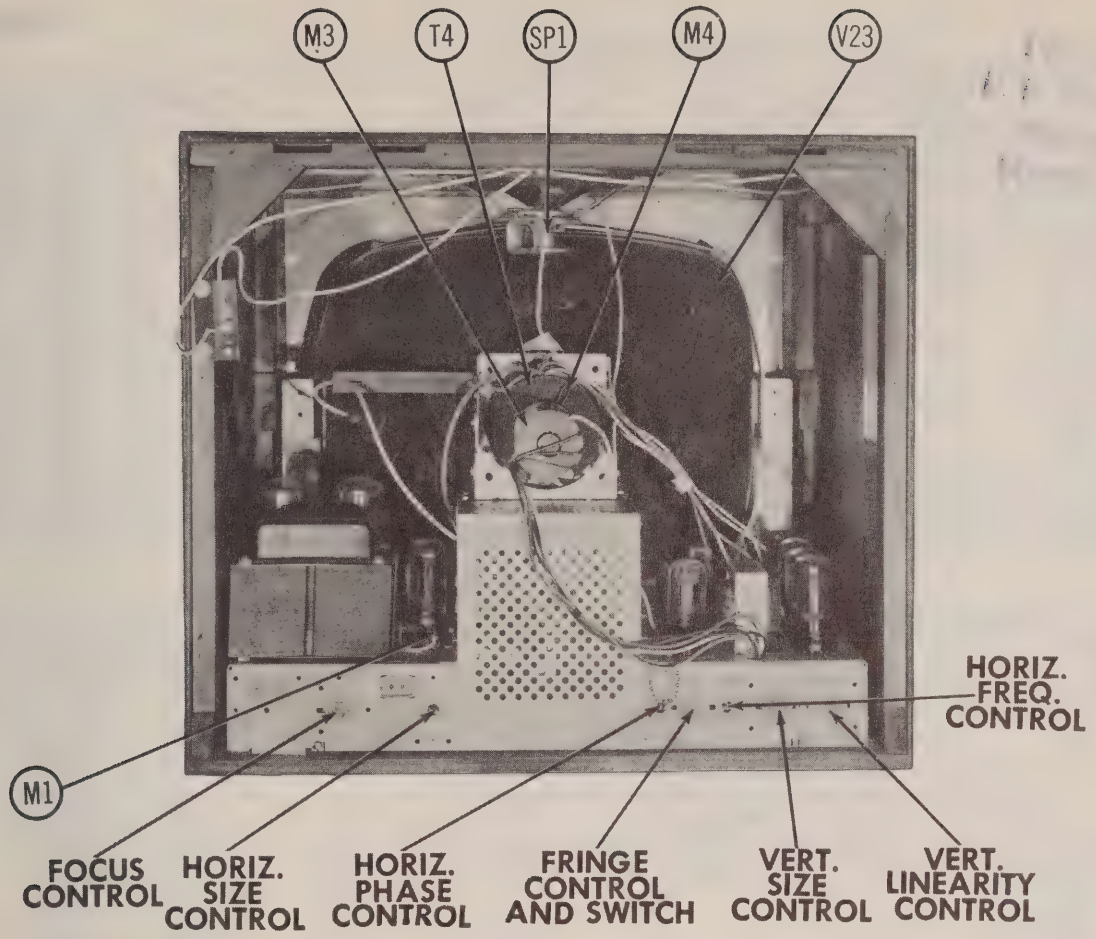
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust Horizontal phasing as follows:

1. Turn horizontal hold fully clockwise.
2. Short the phasing coil by means of a clip lead across the phasing coil terminal strip mounted on top rear of chassis (near V17).
3. Starting with horizontal frequency slug (B1) all the way out, rotate clockwise until picture just locks into sync.
4. Adjust horizontal size slug (B3) if necessary. If picture loses sync readjust B1.
5. Remove short from phasing coil and starting from fully counter clockwise position, rotate phasing slug (B2) clockwise until picture locks into sync.
6. Switch momentarily to another channel, then back again. If picture is out of sync turn B2 clockwise until picture locks in again.
7. Repeat check for all channels as in step 6. If necessary make slight adjustment of B2 until all channels received will stay in sync.

Adjust the horizontal size slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

FRINGE COMPENSATOR ADJUSTMENT

Improper adjustment may result in audio buzz or picture wiggle. Adjust only if necessary to insure stable operation in fringe areas.

Turn switch on and turn control to near the center of its range. Check all channels received and adjust control for best performance.

DISASSEMBLY INSTRUCTIONS

① Remove 4 push on type control knobs from front panel.

② Remove 8 wood screws. Remove rear cover.

③ Disconnect built-in antenna. Loosen 2 wood screws. Remove antenna bracket.

④ Disconnect speaker. Remove 2 speaker nuts. Remove speaker.

⑤ Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINES ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	800047	6BQ7	9AJ	
V2	Converter	800538	6J6	7BF	
V3	1st Video IF Amp.	800958	6CB6	7CM	
V4	2nd Video IF Amp.	800958	6CB6	7CM	
V5	3rd Video IF Amp.	800055	6CB6	7CM	
V6	Video Detector-AGC Rectifier	800541	6AL5	6BT	
V7	Video Output	800055	6CB6	7CM	
V8	Sound IF Amp	800533	6AU6	7BK	
V9	Limiter	800533	6AU6	7BK	
V10	Discriminator	800161	6AL5	6BT	
V11	AF Amplifier-AGC Clamper-Noise Suppressor	800057	6AV6	7BT	
V12	Audio Output	800270	6V6GT	7AC	
V13	Sync Amplifier-Horiz. Sync. Sep.	800026	12AU7	9A	
V14	Sync Amplifier	800380	6SN7GT	8BD	
V15	Vert. Mult.	800380	6SN7GT	8BD	
V16	Vert. Output		6W6GT	7AC	
V17	Horiz. AFC-Horiz. Oscillator	800088	6SN7GT	8BD	
V18	Horiz. Output	800048	6BQ7GT	6AM	
V19	Damper	800077	6W4GT	6CG	
V20	HV Rectifier	800067	1X2A	9Y	
V21	LV Rectifier	800136	5U4G	5T	
V22	LV Rectifier	800136	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V23	17LP4	17LP4 17VP4	12C 12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C1A	40	300	925226	AFH3-44		UPT44445		FP377	TVL-3787	Red
B	40	300								Blue
C	40	300								Green
C2A	40	350	925221							Blue
B	10	400								Yellow
C	100	50								Green
D	80	300								Red
C3	3-8				829-10					
C4	3-8				829-10					
C5	3						C7565A			
C6	.5-3				829-3					
C7	130			SM30	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C8	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C9	47			SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C10	.5-3				EE-3			C7565A		
C11	1000			BPD-001	DD-102	TM5D1	801-001	DC-525	5HK-D1	
C12	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C13	8			SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C14	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C15	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8		5TCCB-V68	
C16	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	.33	400	922335	P488-22		PTE4P22		PT4025	4TM-P22	
C18	1000		922077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	39		928063		TCN-39		N750K-390			
C21	5		928017	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C22	1000		922077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	470		928061	SI47Q	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C24	1000		922077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	470		928061	SI47Q	D6-471	TM5T5	GP1K-471	UC-5347	5GA-T47	
C26	1000		922077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	680		928076	SI680	D6-681	5W5T7	GP2K-681	UC-5368	5GA-T68	
C30	680		928076	SI680	D6-681	5W5T7	GP1K-681	UC-5368	5GA-T68	
C31	1000		922077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	33		928013	SI33	D6-330	5W5Q25	GP1K-330	UC-5432	5GA-Q32	
C33	1000		928077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	5		928017	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C35	.33	300	922335	P488-22		PTE4P22		PT4025	4TM-P22	
C36	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C37	.1	200	922316	P288-1	DF-104	PT2P1		PT401	2TM-P1	
C38	1000		928077	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C40	.01	600	922716	P668-01	D6-103	PTE6S1		PT6S1	6TM-S1	
C41	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	68	500	910231	1469-00007	D6-680	5W5Q7	GP1K-680	UC-5468	MS-47	
C46	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	110	500	910240							
C49	.0022	400	922523	P668-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C50	.0047	600	922353	P668-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C51	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C52	.0047	400	922553	P668-0047	D6-472	PTE6D47	GP1-333-472	PT6247	6TM-D47	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C53	.01	400	922514	P488-01	D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C54	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C55	220	500	910062	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C56	47	500	910058	1469-00005		5R5Q5		MCB225	MS-45	
C57	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C58	.0047	400	922453	P488-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C59	.047	400	922354	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C60	.047	400	922454							
C61	.1	400	922515	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C62	.01	600	922714	P668-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C63	.01	400	922514	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C64	82	500	910056							
C65	82	500	910056							
C66	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C67	.047	400	922554	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C68	.022	200	922324	P488-022		PTE4S22		PT4122	4TM-S22	
C69	.47	200	922355	P288-47		P22P5		PT405	2TM-P47	
C70	270	1000	910046					MCK327		
C71	.01	600	922041							
C72	620	500	910218					MCK362		
C73	.001	400	922413	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C74	.1	400	922515	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C75	.47	200	922355	P288-47		P22P5		PT4025	2TM-P47	Note 1
C76	.1	600	922715	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C77	.05	400	922200	489ZGXY-05		P24S5		PT415	4TM-S5	
C78	.05	400	922200	489ZGXY-05		P24S5		PT415	4TM-S5	

Note 1. Chassis coded Triangle E uses .22MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	390201	QJ-313 *	RTV-396	SBB-701-B	UP152L	Contrast-Panel
B	1 Meg	½					UR16A	Volume- Rear
C	Switch						US-26	Attach to R1B
R2A	200KΩ	½	390181	QJ1-139	AG-53-8	AB-46	U-43	Brightness
B	Shaft		Not Req.	C3†	KS8-5	AK-4	D6-36	Attach to R2A
R3A	1 Meg	½	390158	QJ1-137	AG-61-8	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	C3†	KS8-5	AK-4	D6-36	Attach to R3A
R4A	50KΩ	½	390183	QJ1-133	AG-44-8	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	C3†	KS8-5	AK-4	D6-36	Attach to R4A
R5A	5000Ω	2	390197		WK-5000	A43-5000	WK-135	R5000L Vert. Linearity-Wire Wound
B	Shaft		Not Req.		FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2 Meg	½	390196	QJ1-139	AG-83-8	AB-75	SU-58	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
C	Switch		Not Req.	Not Req.	FWB	E3-1	UB-36	Fringe Compensator
R8A	2 Meg	½	390196	QJ1-139	AG-83-8	AB-75	SU-58	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B1T-110 & P1-224 (Panel), B1J-137 & R1-208 (Rear) & Switch 76-1.

† Use C3 coupler and part of original shaft to obtain required length.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R9	15KΩ	½			
R10	47KΩ	½			
R11	100KΩ	½		BTS-100K	
R12	330KΩ	½		BTS-330K	
R13	180KΩ	½			
R14	470Ω	½		BTS-470	
R15	15KΩ	½			Note 6
R16	220KΩ	½		BTS-220K	
R17	15KΩ	½			
R18	10KΩ	½			
R19	4700Ω	½		BTS-4700	
R20	470Ω	½		BTS-470	
R21	470Ω	½		BTS-470	
R22	15Ω	1	340052		
R23	47Ω	1	340172		
R24	470Ω	1	340412	BTS-470	
R25	470Ω	1	340412	BTS-470	
R26	470Ω	1	340412	BTS-470	
R27	27KΩ	1	340832	BTS-27K	
R28	47Ω	1	340172		
R29	470Ω	1	340412	BTS-470	
R30	8200Ω	1	340712	BTS-8200	
R31	180Ω	1	340312	BTS-180	
R32	470Ω	1	340412	BTS-470	
R33	470Ω	1	340412	BTS-470	
R34	1 Meg	1	351212	BTS-1 Meg	
R35	1 Meg	1	351212	BTS-1 Meg	
R36	100KΩ	1	[illegible]	BTS-100K	Note 5
R37	1 Meg	1	351212	BTS-1 Meg	
R38	15KΩ	1	340772	BTS-15K	
R39	4700Ω	1	340852	BTS-4700	
R40	10KΩ	1	340732	BTS-10K	
R41	1 Meg	1	351212	BTS-1 Meg	
R42	220KΩ	1	351052	BTS-220K	
R43	22KΩ	1	340812	BTS-22K	
R44	6800Ω-5%	2	370692	BTS-6800-5%	
R45	220KΩ	½	[illegible]	BTS-220K	
R46	470KΩ	1	351132	BTA-470K	
R47	470KΩ	1	351132	BTA-470K	
R48	680KΩ-5%	½	351172	BTS-680K-5%	
R49	220Ω	1	340332	BTS-220	
R50	1000Ω	1		BTS-1000	Note 7

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R51	47KΩ	½	350892	BTS-47K	
R52	1 Meg	½	351212	BTS-1 Meg	
R53	10KΩ	½	340732	BTS-10K	
R54	10KΩ	½	340732	BTS-10K	Note 3
R55	15KΩ	1	370772	BTA-15K	Note 4
R56	10 Meg	½	351452	BTS-10 Meg	
R57	1000Ω	1		BTS-1000	Note 7
R58	100KΩ	1	340972	BTS-100K	
R59	100KΩ	½	340972	BTS-100K	
R60	68KΩ	½	340932	BTS-68K	
R61	10 Meg	½	351452	BTS-10 Meg	
R62	220KΩ	½	351052	BTS-220K	
R63	470KΩ	½	351132	BTS-470K	
R64	1000Ω	1		BTS-1000	Note 7
R65	1000Ω	1		BTS-1000	Note 8
R66	1500Ω	3	790532	BTB-1500	
R67	100KΩ	1	350972	BTS-100K	
R68	33KΩ	1	380852	BTA-33K	
R69	100KΩ	½	350972	BTS-100K	
R70	10KΩ	½	350732	BTS-10K	
R71	2.2Meg	½	351292	BTS-2.2Meg	
R72	100KΩ	½	340972	BTS-100K	
R73	10 Meg	½	351452	BTS-10 Meg	
R74	150Ω	1	340292		
R75	2200Ω	1	340572	BTS-2200	
R76	150KΩ	½	340912	BTS-150K	
R77	820KΩ-5%	½	341192	BTS-820K-5%	Note 9
R78	1 Meg	½	351212	BTS-1 Meg	
R79	12KΩ	1	340752	BTS-12K	
R80	47KΩ	½	350892	BTS-47K	
R81	1 Meg	½	351212	BTS-1 Meg	Note 10
R82	1 Meg	½	351212	BTS-1 Meg	Note 8
R83	470Ω	1	350412	BTA 470	
R84	33KΩ	1	350852	BTA-33K	
R85	4700Ω	3	380852	BTS-4700	
R86	22KΩ	1	370812	BTA-22K	
R87	2.2Meg	½	351292	BTS-2.2Meg	
R88	12KΩ	1	340752	BTS-12K	Note 2
R89	27KΩ	1	370832	BTA-27K	
R90	330KΩ-5%	1		BTA-330K-5%	
R91	820KΩ-5%	1	341192	BTS-820K-5%	
R92	82K-5%	1		BTA-82K-5%	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R93	330KΩ-5%	½		BTA-330K-5%	
R94	3900Ω	1	340832	BTS-3900	
R95	150KΩ	½	341012	BTS-150K	
R96	180KΩ	½	341032	BTS-180K	
R97	82000Ω	½	340712	BTS-8200	
R98	150KΩ	½	341012	BTS 150K	
R99	47KΩ	½	[illegible]	BTS 47K	
R100	470KΩ	½	341132	BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R101	68Ω	1			
R102	100Ω	2	790252	BW-2-100	
R103	6800Ω	2	780692	BTB-6800	
R104	33Ω	½	340332		
R105	8.5Ω	5	394122		
R106	1250Ω	10	394116	1 3/4A-1250	
R107	100KΩ	1	380972	BTA-100K	

Note 1. Chassis coded triangle F use 330KΩ resistor in this application.
Note 2. Chassis coded triangle F use 10KΩ resistor in this application.
Note 3. Chassis coded triangle G use 6800Ω resistor in this application.
Note 4. Chassis coded triangle G use 22KΩ resistor in this application.
Note 5. Used only in chassis coded triangle G.
Note 6. Some models use a 22KΩ resistor in this application.
Note 7. Some models use a 470Ω resistor in this application.
Note 8. Not used in all models.
Note 9. Some models use a 680KΩ resistor in this application.
Note 10. Some models use a 2.2Meg resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No
T1	117VAC @ 1.8A	456VCT .235A.	5VAC @ 6.5A SEC. 4 12.6VAC CT @ 4.8A	6.3VAC @ 1.35A	730037				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI	RATING: DC RESISTANCE SEC	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No	NOTES
T2	830Ω	46Ω tap @ 5Ω (7Ω) 30Ω SEC. 2 0Ω	738067	A-8150 ①	HVO-7 ②	TFB-5 ③	D-14 ④	Horiz. Output Trans.
T3	298Ω	tap @ 8Ω	738066	A-8115 ⑤ ⑧	A-3038 ⑤	TSO-2 ⑤ ⑧	A-101U ⑤ ⑧	Vert. Output Trans.
T4A	48Ω		708137	MDF-71	TT-7	T-19		Horiz. Deflection Coils
B	48Ω							Vert. Deflection Coils

① Use with Width Coil WC-5
② Use with Width Coil WWC-1
③ Use with Width Coil TWL-1
④ Use with Width Coil WC-11
⑤ Connect as Auto trans.
⑧ Drill new mounting holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No	NOTES
T5	4.6KΩ	3.6Ω	265Ω	.58Ω	734074	A-3877 ①	A-2930 ①	RO-8 ①	S-3X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	6"	PM	3.8Ω	180041C 180050 ① 180062 ①	ST-108 Mod. P6-X	6A1	12" Speakers used on Model 719D

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (D CURRENT 1000 ℃)	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No
L1	.200A	75Ω	1.5 Hy.	737016 or 737017	C-2326 ①	C-2991 ①	TR-3300 ①	C-21X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
L2	FM Trap	0Ω					Wound on 68MMF capacitor
L3	FM Trap	0Ω					Wound on 68MMF capacitor
L4	Ant. Coils	0Ω					
L5	RF Choke	1.4Ω					
L6	Fil. Choke	0Ω					
L7	Neutralizing Coil	0Ω					
L8	RF, Mixer Grid & Osc. Coils	0Ω					

PARTS LIST AND DESCRIPTIONS (Continued)

RF-IF (COILS) CONT.

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
L9	Fil. Choke	0Ω					
L10	Feedback Coil	.8Ω					
L11	RF Choke	0Ω					
L12	Conv. Plate	.1Ω	0Ω				
L13	Adj. Sound Trap	0Ω		720154			
L14	Sound Carrier Trap	0Ω		720149			
L15	1st. Video IF	.1Ω		720147			
L16	Fil. Choke	.44Ω		705020		CLA	.68 Microhenry
L17	2nd. Video IF	.1Ω	.1Ω	720148			
L18	3rd. Video IF	.1Ω	.1Ω	720148			
L19	Fil. Choke	.44Ω		705020		CLA	.68 Microhenry
L20	4th. Video IF	.1Ω	.1Ω	720148			
L21	Fil. Choke	.44Ω		705020		CLA	.68 Microhenry
L22	Shunt Peaking Coil	17Ω		708114	TV-188		440 Microhenries
L23	4.5MC Trap			708032			Used in sets code Triangle (▲) D, E, F & G
L24	Series Peaking Coil	11.5Ω		708100	TV-185		250 Microhenries
L25	Shunt Peaking Coil	17Ω		708114	TV-188		440 Microhenries, Sets coded Triangle, (▲) C, D, E, F & G, use 660 Microhenries Peaking Coil
L26	1st. Sound IF	8Ω	3.8Ω	720146	TV-113		
L27	2nd. Sound IF	1.8Ω	1.8Ω	720081 *	TV-113		
L28	Discriminator	2.1Ω	2.3ΩCT	708018 ‡	TV-114 ▲		
L29	Horiz. Osc.	140Ω		716073			
L30	Horiz. Phase	29Ω		738065 ■			
L31	Width Coil	4Ω		708156			
L32	RF Choke	8.2Ω		705021		CL-1	10 Microhenries

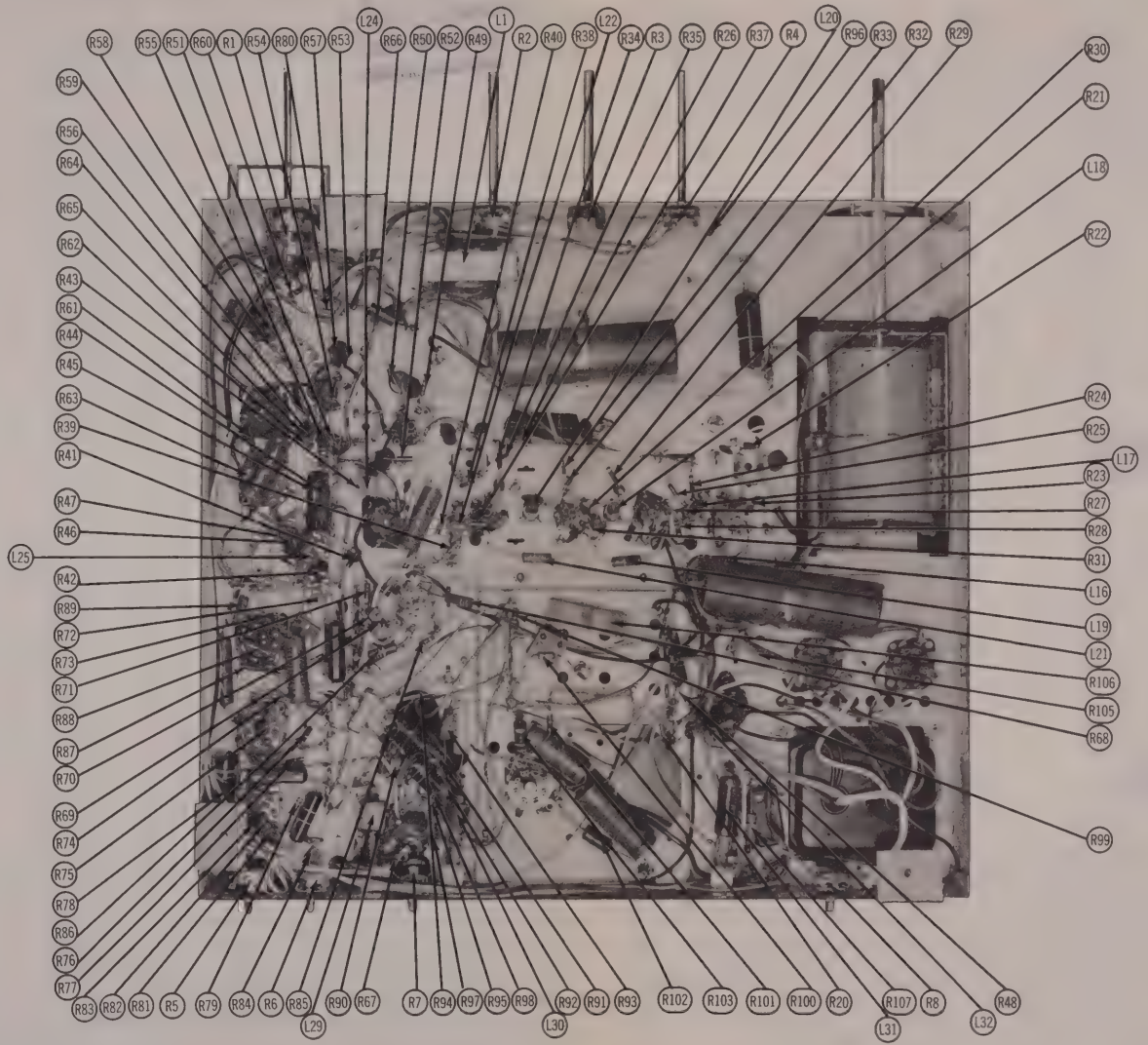
* Alternate part #720081A
‡ Alternate part #708151
■ Alternate part # 738071 or #708158
▲ Use adaptor plate

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA EMERSON PART No. FUSE	EMERSON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3 AG	1/2 A. 250V.	808003		312.500	357001	AGC-1/2	4405

MISCELLANEOUS

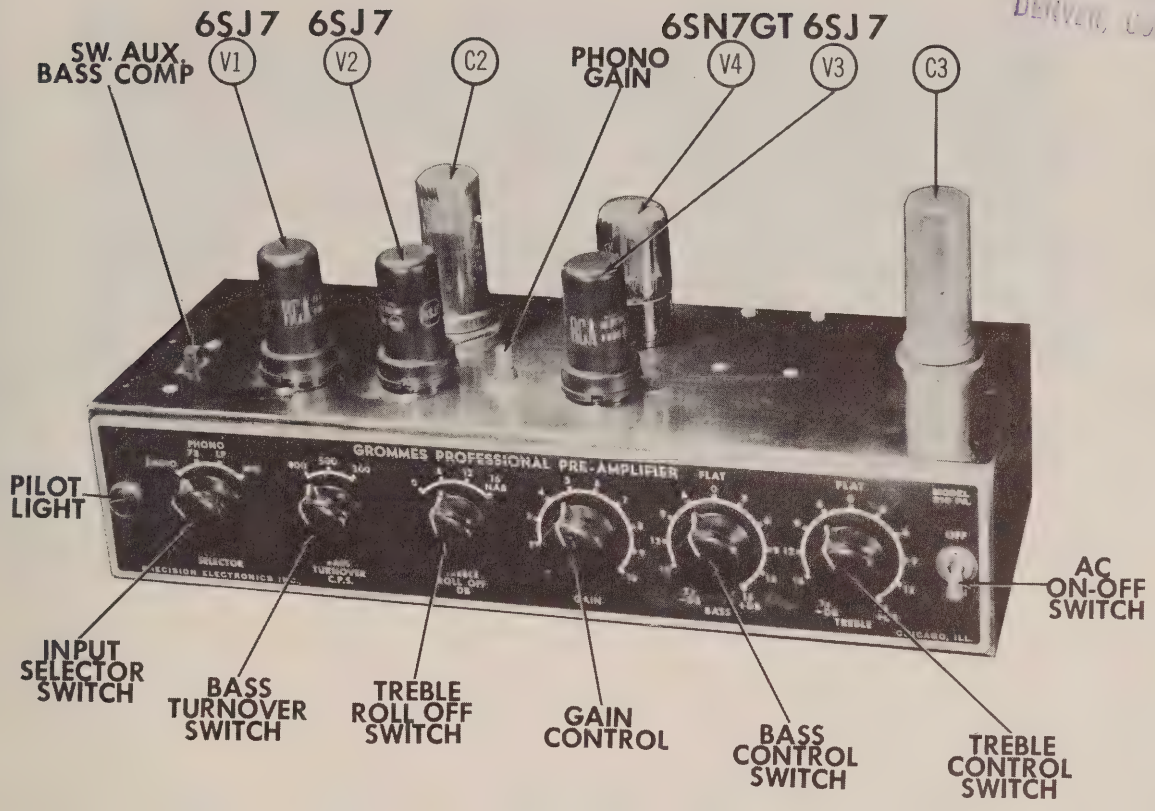
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	RF Tuner	470696	
M3	Ion Trap	708129	
M4	Centering Magnet	708133	
	Cabinet	140468	Mahogany, Model 716D
	Cabinet	140469	Early American Maple, Model 717D
	Cabinet	140469A	Early American Mahogany, Model 717D
	Cabinet	140471	Model 719D
	Cabinet	140411	Model 722D
	Mask	460296	Models 716D, 717D and 719D
	Mask	460293	Model 722D
	Glass	520159	Models 716D, 717D and 719D
	Glass	520149	Model 722D
	Control Door	460252	
	Escutcheon	460253	Control Door
	Back Cover	560293	Models 716D and 717D
	Back Cover	560298	Model 719D
	Back Cover	560313	Model 722D
	Knob	450138	Contrast Control,
	Knob	450137	Fine Tuning,
	Knob Shank	450134	Off/On Volume,
	Knob Flange	460262	Off/on Volume,
	Knob Shank	450133	Channel Selector,
	Knob Flange	460261	Channel Selector,



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. I. [illegible] SCHOOLSHIP
[illegible] ST.
DENVER, COLORADO

GROMMES
MODELS 117PS, 210PA



GROMMES
MODELS 117PS, 210PA

TRADE NAME	Grommes Models 117PS (Power Supply), 210PA (Pre-Amp.)
MANUFACTURER	Precision Electronics, Inc., 641 Milwaukee Ave., Chicago, Ill.
TYPE SET	AC Operated 3 Channel Audio Pre-Amplifier & Power Supply
TUBE (FIVE)	Types 6SJ7 Pre-Amp.,(2) 6SJ7 AF Amp., 6SN7GT AF Amp.-Cathode Follower, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .26 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: GROMMES PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Pre Amplifier	6SJ7	6SJ7	8N	
V2	AF Amplifier	6SJ7	6SJ7	8N	
V3	AF Amplifier	6SJ7	6SJ7	8N	
V4	AF Amplifier-Cathode Follower	6SN7GT	6SN7GT	8BD	
V5	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400		AFH4-78		UP43145C		FP429	TVL-4734	
B	■30	350								
C	▲10	300								
D	20	25								
C2A	10	350		AFH3-27		UP11135		FP330.5	TVL-3690	
B	▲10	350								
C	■10	350								
C3A	■10	350		AFH3-27		UP11135		FP330.5	TVL-3690	
B	▲10	350								
C	10	350								
C4	10	250		PRS250/12		BR1225A		TC52	TVA-1504	
C5	10	250		PRS250/12		BR1225A		TC52	TVA-1504	
C6	20	25		PRS25/25		BR202A		TC26	TVA-1205	Note 1
C7	470	500								Note 2
C8	1500	500		1464-0015		1R5D15		MCB456		
C9	.002	400		P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C10	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C11	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C12	2200	500		1464-002		1DR5D2		MCB457	MS-22	Note 3
C13	3000	500		1464-003		1R5D3		MCB461	MS-23	
C14	1500	500		1464-0015		1R5D15		MCB456		
C15	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C16	.03	400		P488-03		PTE6S3		PT413	6TM-S3	
C17	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C18	470	500								Note 1
C19	1000	500		1464-001		2R5D1		MCB255	MS-21	
C20	1500	500		1464-0015		1R5D15		MCB456		
C21	.002	400		P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C22	3000	500		1464-003		1R5D3		MCB461	MS-23	
C23	.03	400		P488-03		PTE6S3		PT413	6TM-S3	
C24	.015	600		P688-015		PTE6S15		PT6115	6TM-S15	
C25	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C26	.5	600		630-.5		DYR6050		CB604	BP-506	
C27	5600	500								Note 4
C28	5600	500								Note 4
C29	5600	500								Note 4
C30	5600	500								Note 4
C31	.015	600		P688-015		PTE6S15		PT6115	6TM-S15	
C32	1000	500		1464-001		2R5D1		MCB255	MS-21	
C33	3000	500		1464-003		1R5D3		MCB461	MS-23	
C34	6000	500		1464-006				MCB467	MS-26	
C35	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C36	.002	400		P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C37	.5	600		630-.5		DYR6050		CB604	BP-506	

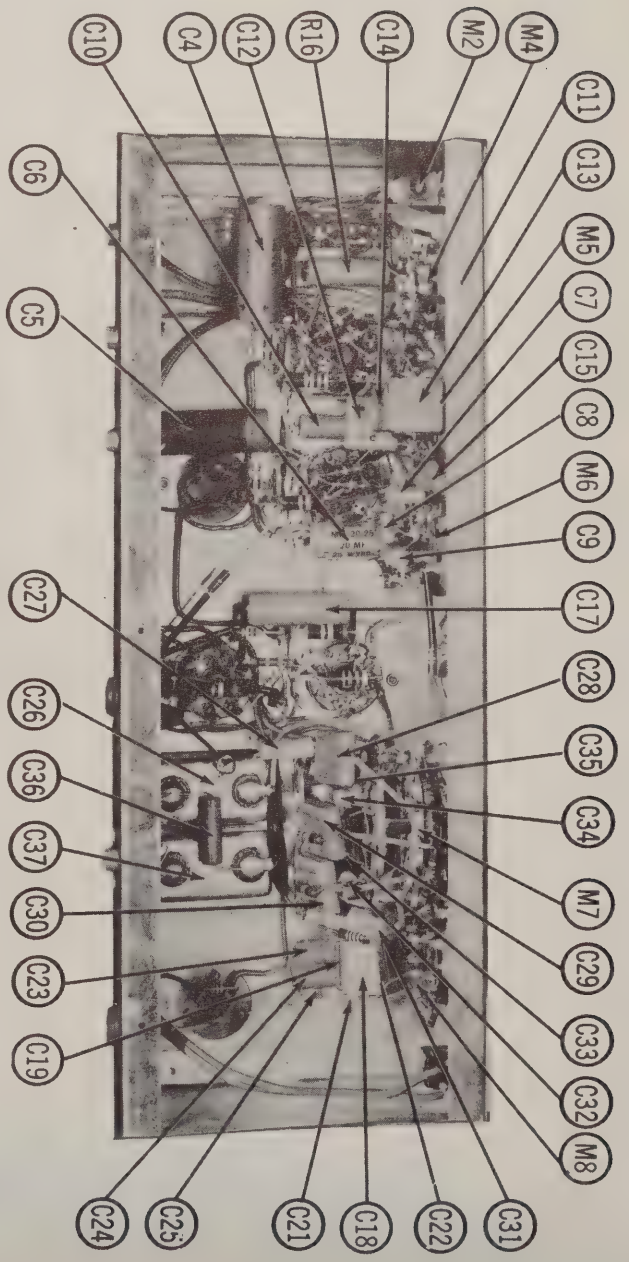
Note 1. Some Models use 25MFD in this application.
Note 2. Some Models use 500MMF in this application.
Note 3. Some Models use 2000MMF in this application
Note 4. Some Models use 5000MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	GROMMES PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	W3637	Q18-133X	AT-88	BT-63	UT-429	Volume-Tap@ 50KΩ
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	1.5Meg	1/2	W3181	Q13-139	AG-66-Z	B-76	U-55	Phono Volume -Note
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A

Note: Some Models use a 500KΩ control in this application.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R3	4.7Meg	1/2		BTS-4.7Meg	
R4	4.7Meg	1/2		BTS-4.7Meg	
R5	4.7Meg	1/2		BTS-4.7Meg	
R6	47KΩ	1/2		BTS-47K	
R7	22KΩ	1/2		BTS-22K	Note 1
R8	470KΩ	1/2		BTS-470K	
R9	2700Ω	1		BTA-2700	
R10	220KΩ	1/2		BTS-220K	
R11	1 Meg	1/2		BTS-1 Meg	
R12	470KΩ	1		BTA-470K	
R13	68KΩ	1/2		BTS-68K	Note 2
R14	4.7Meg	1/2		BTS-4.7Meg	
R15	470KΩ	1/2		BTS-470K	
R16	4.7Meg	1/2		BTS-4.7Meg	
R17	4.7Meg	1/2		BTS-4.7Meg	
R18	2.2Meg	1/2		BTS-2.2Meg	
R19	1000Ω	1/2		BTS-1000	
R20	470KΩ	1/2		BTS-470K	
R21	470KΩ	1/2		BTS-470K	
R22	100KΩ	1		BTA-100K	
R23	27KΩ	1/2		BTS-27K	
R24	470Ω	1		BTA-470	
R25	47KΩ	1/2		BTS-47K	
R26	4700Ω	1		BTA-4700	
R27	100KΩ	1		BTA-100K	
R28	1 Meg	1/2		BTS-1 Meg	
R29	2200Ω	1/2		BTS-2200	
R30	47KΩ	1		BTA-47K	
R31	100KΩ	1		BTA-100K	
R32	27KΩ	1/2		BTS-27K	
R33	4700Ω	1		BTA-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R34	2700Ω	1		BTA-2700	
R35	100KΩ	1/2		BTS-100K	
R36	27KΩ	1/2		BTS-27K	
R37	3.3Meg	1/2		BTS-3.3Meg	
R38	3.3Meg	1/2		BTS-3.3Meg	
R39	3300Ω	1/2		BTS-3300	
R40	4700Ω	1/2		BTS-4700	
R41	3.3Meg	1/2		BTS-3.3Meg	
R42	3.3Meg	1/2		BTS-3.3Meg	
R43	3.3Meg	1/2		BTS-3.3Meg	
R44	3.3Meg	1/2		BTS-3.3Meg	
R45	3.3Meg	1/2		BTS-3.3Meg	
R46	3.3Meg	1/2		BTS-3.3Meg	
R47	33KΩ	1/2		BTS-33K	
R48	3.3Meg	1/2		BTS-3.3Meg	
R49	3.3Meg	1/2		BTS-3.3Meg	
R50	3.3Meg	1/2		BTS-3.3Meg	
R51	3.3Meg	1/2		BTS-3.3Meg	
R52	3.3Meg	1/2		BTS-3.3Meg	
R53	3.3Meg	1/2		BTS-3.3Meg	
R54	3.3Meg	1/2		BTS-3.3Meg	
R55	3.3Meg	1/2		BTS-3.3Meg	
R56	3.3Meg	1/2		BTS-3.3Meg	
R57	27KΩ	1/2		BTS-27K	
R58	270KΩ	1/2		BTS-270K	
R59	100KΩ	1/2		BTS-100K	
R60	2700Ω	1		BTA-2700	
R61	10KΩ	1		BTA-10K	
R62	220KΩ	1		BTA-220K	
R63	10KΩ	1		BTA-10K	
R64	3.3Meg	1/2		BTS-3.3Meg	

Note 1 Some models use a 15KΩ resistor in this application.
Note 2 Some models use a 100KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	GROMMES PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .26A	570VCT .010ADC	6.3VCT @ 2.3A						R-5B

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGC	1 A 250V.			312001	342001	AGC-1	HKP

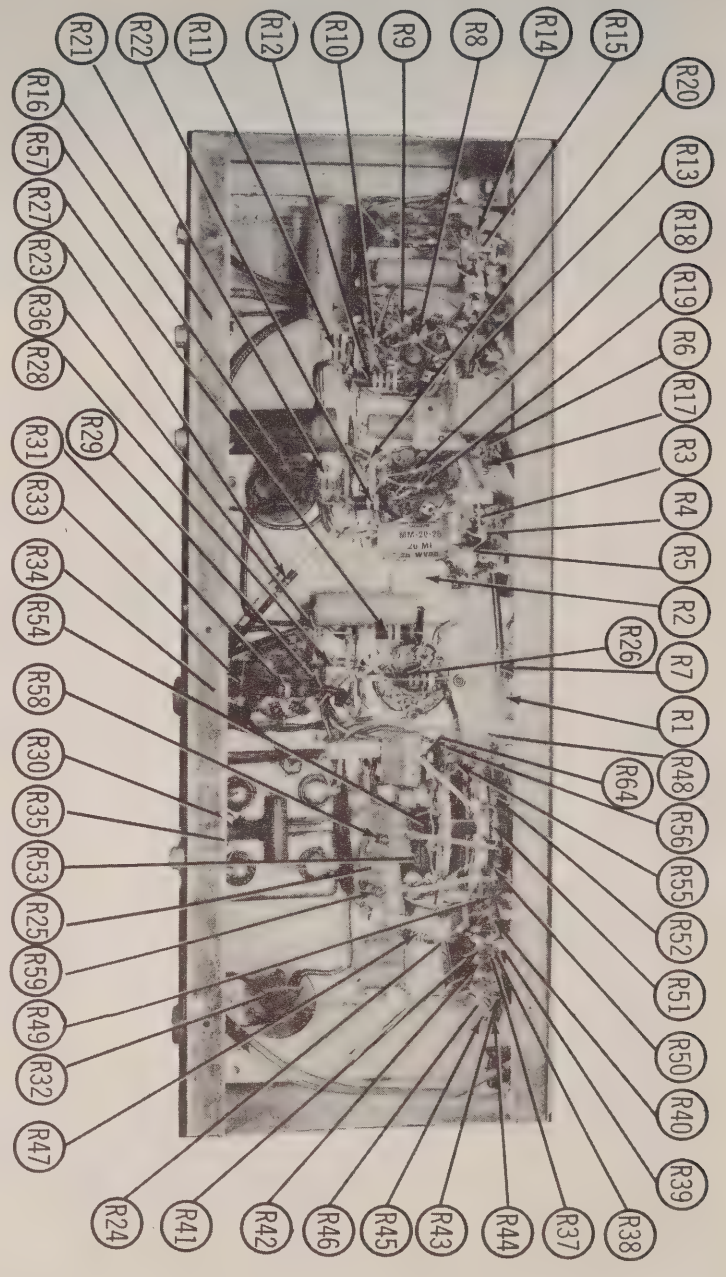
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					GROMMES PART No.		
M2	Bayonet	6-8	.2	White			Type #51

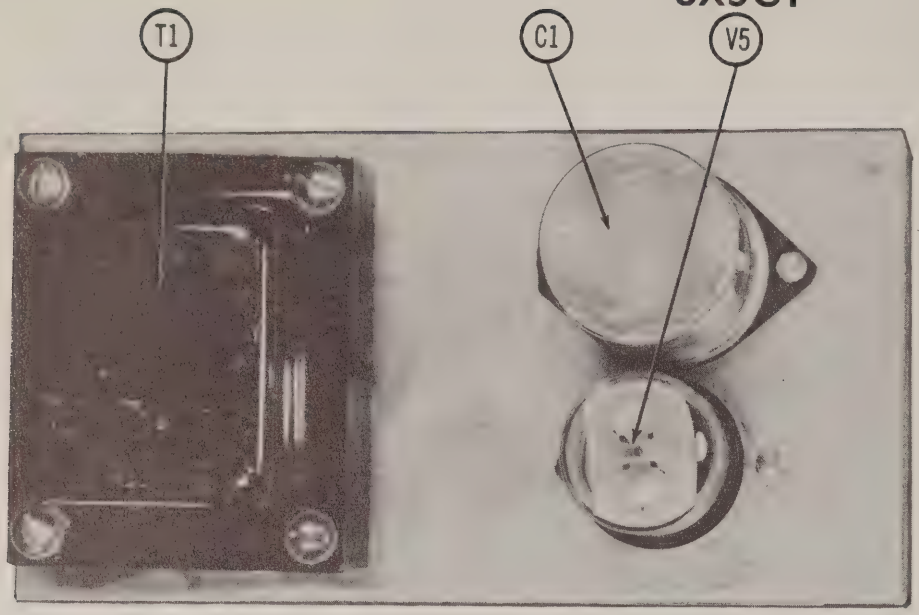
MISCELLANEOUS

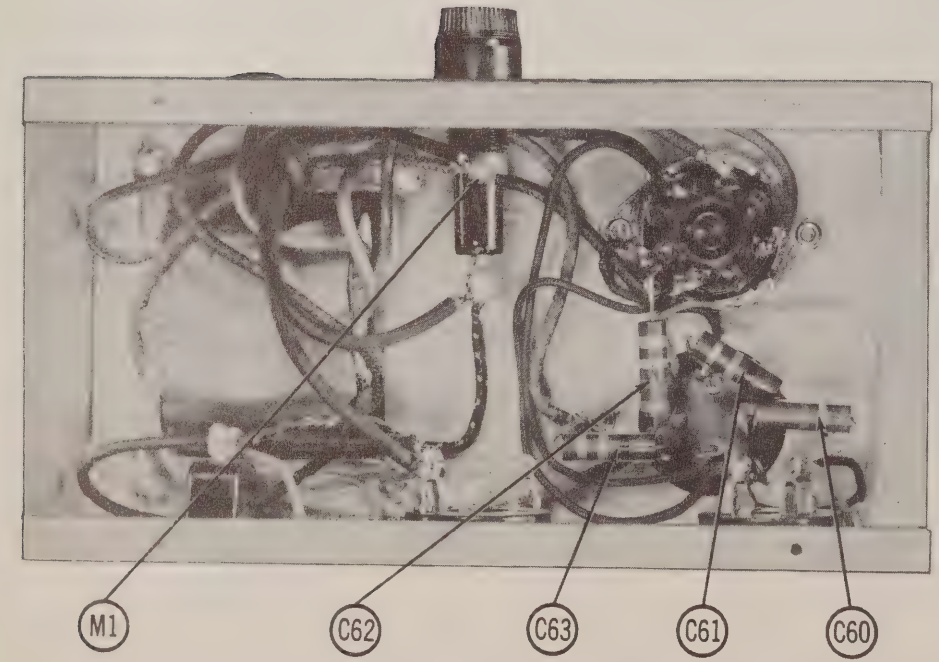
ITEM No.	PART NAME	GROMMES PART No.	NOTES
M3	Switch		Power On-Off
M4	Switch		Input Selector
M5	Switch		Bass Turnover
M6	Switch		Treble Rolloff
M7	Switch		Bass Control
M8	Switch		Treble Control
M9	Switch		Aux. Bass Comp.

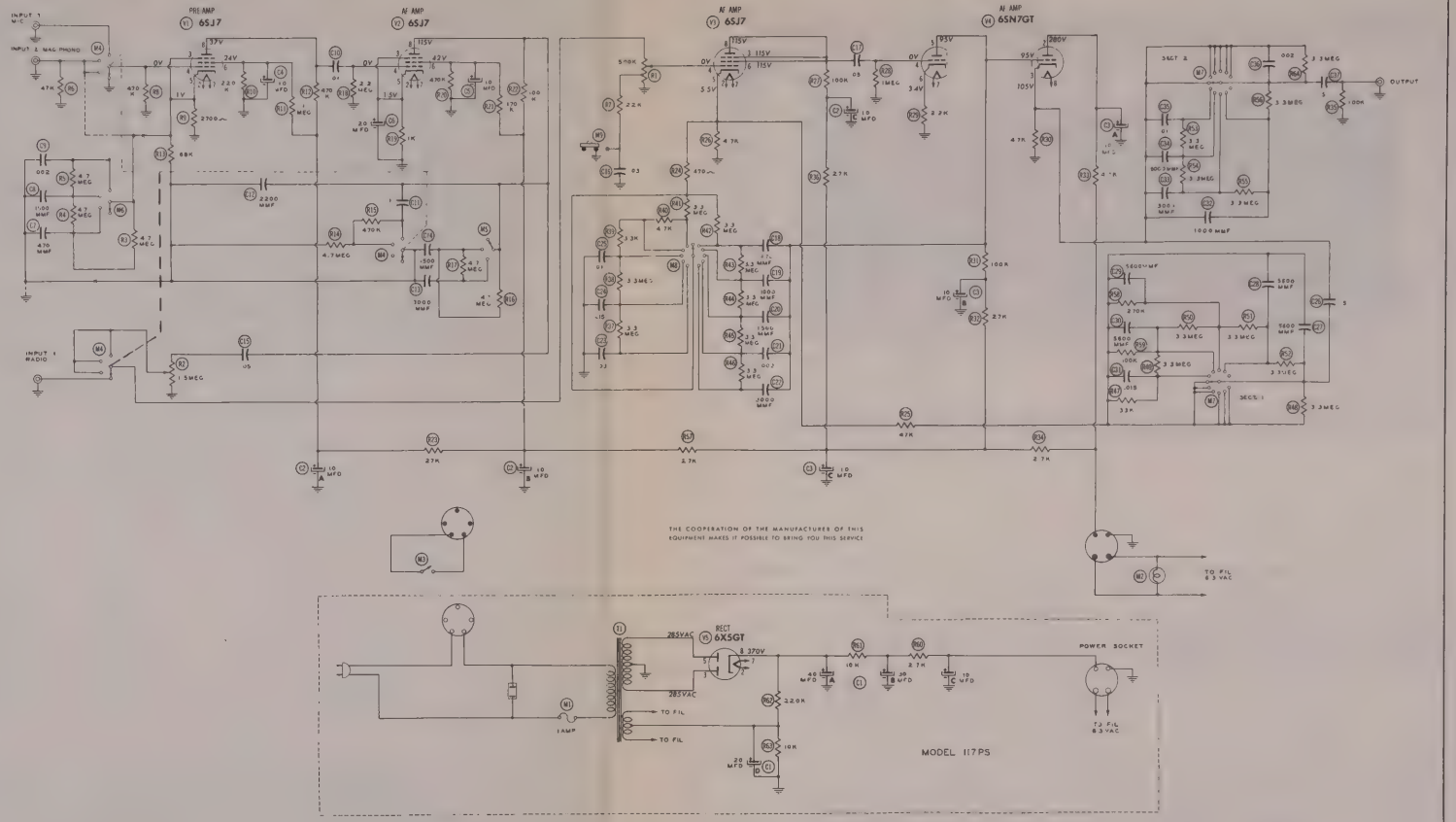
CHASSIS—BOTTOM VIEW



6X5GT







1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shwon as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	10KΩ	2.7KΩ	470KΩ	2.7KΩ	180KΩ	10KΩ	1535KΩ
V 2	6SJ7	0Ω	10KΩ	1KΩ	2.2Meg	1KΩ	250KΩ	10KΩ	†142KΩ
V 3	6SJ7	0Ω	10KΩ	†142KΩ	50Ω	4.7KΩ	†142KΩ	10KΩ	†142KΩ
V 4	6SN7GT	†142KΩ	†17.4KΩ	47KΩ	1 Meg	†142KΩ	2.2KΩ	10KΩ	10KΩ
V 5	6X5GT	INF	10KΩ	270Ω	INF	290Ω	INF	10KΩ	110KΩ

ALL MEASUREMENTS TAKEN WITH "INPUT SELECTOR SWITCH" IN MIC. POSTION
† MEASURED FROM PIN 8 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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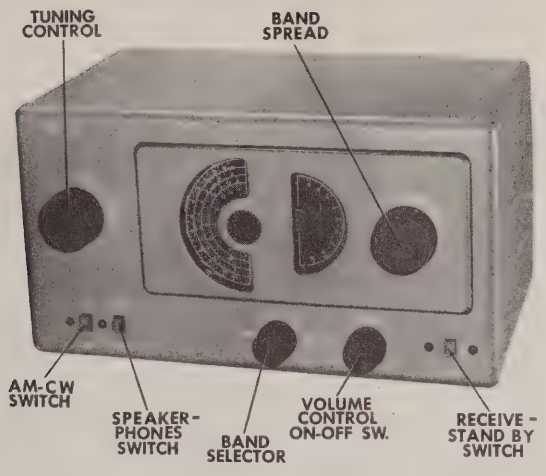
HALLICRAFTERS
MODEL S-38C (Run 2)



TRADE NAME	Hallicrafters Model S-38C (Run 2)
MANUFACTURER	Hallicrafters Co., 4401 W. 5th. Ave., Chicago 24, Ill.
TYPE SET	AC-DC Operated Multi-Band AM Communications Superheterodyne
TUBES (Five)	Types 12SA7 Conv., 12SG7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—	Band #1 (.54-1.7MC), Band #2 (1.7-5MC), Band #3 (5-14MC), Band #4 (14-32MC)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set AM-CW switch to AM (except for BFO adjustment), SPEAKER-PHONES switch to SPEAKER, RECEIVE-STANDBY switch at RECEIVE and BANDSPREAD control at 0.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn bandspread capacitor plates fully open and set bandspread pointer straight up, to the zero position on bandspread dial.
Turn main truning gang fully open and set pointer straight up.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to stator Plates of front section of tuning gang. Low side to chassis.	455 KC (400∿ Mod)	1	1.0MC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	455 KC (Unmod.)	"	"	"	A5	Vary position of wire "gimmick" at pins 4 and 8 of V2 for maximum beat. (Set AM-CW switch to CW for this step only). Adjust A5 (gimmick) only if weak beat note indicates need.
3.	RTMA Fig. 1	High side thru dummy to left hand antenna terminal (viewed from rear of chassis). Low side to chassis.	30MC (400∿Mod)	4	30MC	"	A6, A7	Adjust in order given for maximum output.
4.	"	"	14MC	3	14MC	"	A8, A9	"
5.	"	"	5MC	2	5MC	"	A10, A11	"
6.	"	"	1500 KC	1	1.5MC	"	A12, A13	"
7.	"	"	600 KC	1	.6MC	"	A14	Adjust for maximum output.

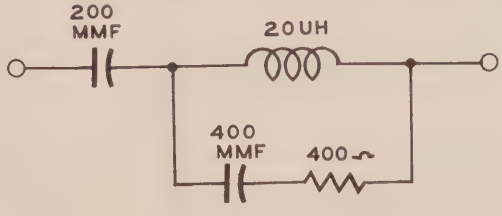


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

HALLICRAFTERS
MODEL S-38C (Run 2)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT		
V1	Converter	90X12SA7	12SA7	8R	
V2	IF Amp. -BFO	90X12SG7	12SG7	8BK	
V3	Det. -AVC-AF Amp.	90X12SQ7	12SQ7	8Q	
V4	Audio Output	90X50L6GT	50L6GT	7S	
V5	Rectifier	90X35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	60	150	45B091	PRS1010D4A		EZ55515C		3N532	TVA-3436	
B	40	150		PRS150/40				TC49	TVA-1413	
C	40	150								
D	20	25								
C2	2700	500	47X30B272K							
C3	220	500	47X20B221K	1469-00025		5R5T25		MCB240	MS-325	
C4	220	500	47X20B221K	1469-00025		5R5T25		MCB240	MS-325	
C5	3000	500	47X30B302J	1464-003		1R5D3		MCB461	MS-23	
C6	2200	500	47X30B222J							
C7	5000		47A168	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C8	5000		47A168	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C9	.02	600	46AY203J	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C10	.002	600	46AZ202F	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C11	.05	200	46AU503J	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C12	220	500	47XZ0B221K	1468-00025	D6-221	5W5T25	GP2K-221		1FM-325	
C13A	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322		
B	2000		46A151	BPD-002	DD-202	TM5D2	801-002	DC-522	34C3	
C	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322		
D	5000			BPD-005	DD-502	TM5D5	811-005	DC-525		
C14	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C15	.02	600	46AY203J	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C16	10000		47A217	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C17	.022	600	46BR203L6	689ZCXY-02		PJ6S2		PT6122	6TM-S22	
C18	.05	600	46AY503J	P688-05		PTE6S5		PT615	6TM-S5	

CONTROLS

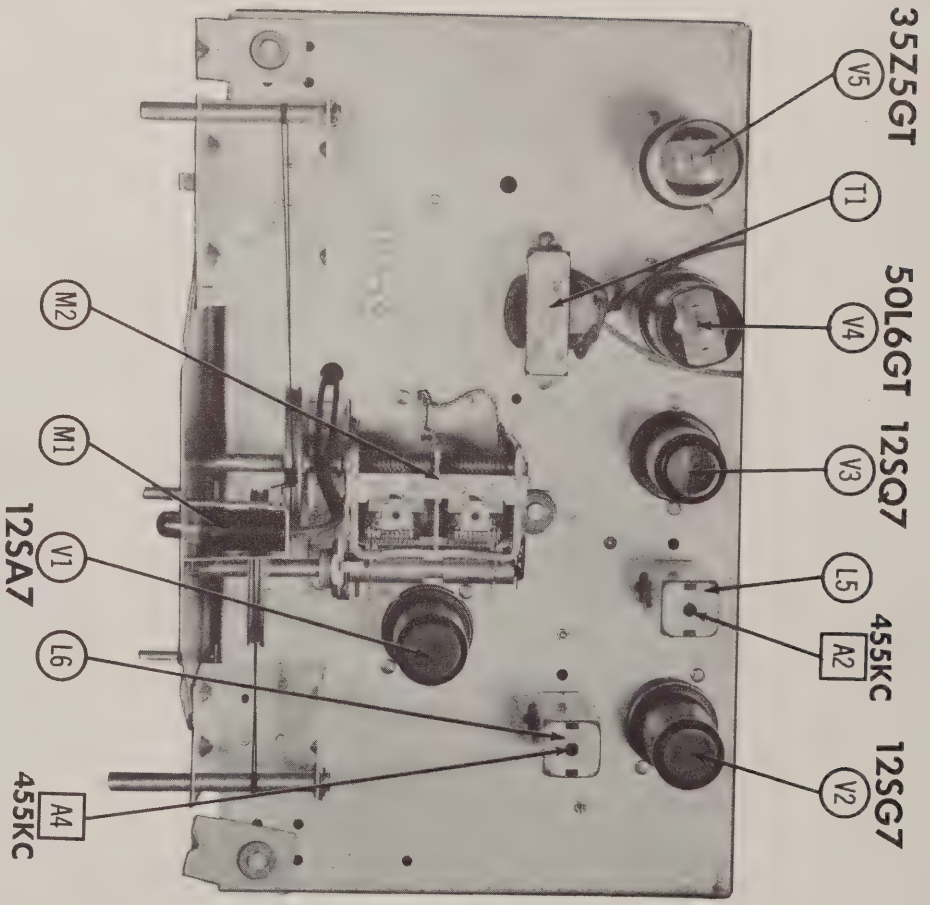
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2 Meg	½	25B896	Q13-139	AG-66-Z	B-76-S	U-55	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R2	10KΩ	½	23X20X103M	BTS-10K	
R3	22Ω	½	23X20X220M		
R4	15Ω	½	23X20X150M		
R5	470KΩ	½	23X20X474M	BTS-470K	
R6	22KΩ	½	23X20X223M	BTS-22K	
R7	22Ω2	½	23X20X220M		
R8	2.2Meg	½	23X20X225M	BTS-2.2Meg	
R9	2.2Meg	½	23X20X225M	BTS-2.2Meg	
R10	470Ω	½	23X20X471K	BTS-470	
R11	270Ω	½	23X20X271K	BTS-270	
R12	330Ω	½	23X20X331M	BTS-330	
R13	47KΩ	½	23X20X473M	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R14	470KΩ	½	23X20X474M	BTS-470K	
R15	10 Meg	½	23X20X106M	BTS-10 Meg	
R16	220KΩ	½	23X20X224M	BTS-220K	
R17	470KΩ	½	23X20X474M	BTS-470K	
R18	150Ω	½	23X20X151K	BTS-150	
R19	15Ω	½	23X20X150M		
R20	22Ω	½	23X20X220M		
R21	220Ω	1	23X30X221M	BTA-220	
R22	1000Ω	½	23X20X102M	BTS-1000	
R23	15Ω	½	23X20X150M		
R24	470KΩ	½	23X20X474M	BTS-470K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2KΩ	3.2Ω	160Ω	2.78Ω tap @ .81Ω	55A127					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.2Ω	85C030	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Hallicrafters PART No.	MERIT PART No.	IRC PART No.	
L1A	BC Ant. Coil	28Ω	4.2Ω	51C821			Band 1.
B	Sw. Ant. Coil	.8Ω	1.1Ω				Band 2; Part of L1A.
C	Sw. Ant. Coil Secondary		.1Ω				Band 3; Part of L1A.
L2	Sw. Ant. Coil	.3Ω	.1Ω	51B1015			Band 4
L3A	BC. Osc. Coil	2.4Ω		51C822			Band 1; Tapped at 2.2Ω.
B	Sw. Osc. Coil	2.7Ω					Band 2; Tapped at 2.2Ω; Part of L3A.
C	Sw. Osc. Coil	0Ω					Band 3; Part of L3A.
D	Sw. Osc. Coil	0Ω	0Ω				Band 4; Part of L3A.
L4	Cathode Choke	9Ω		53A107	TV-188		540 Microhenries.
L5	Input IF	14.5Ω	14Ω	50C531	BC-352		
L6	Output IF	13Ω	13Ω	50C532	BC-353		

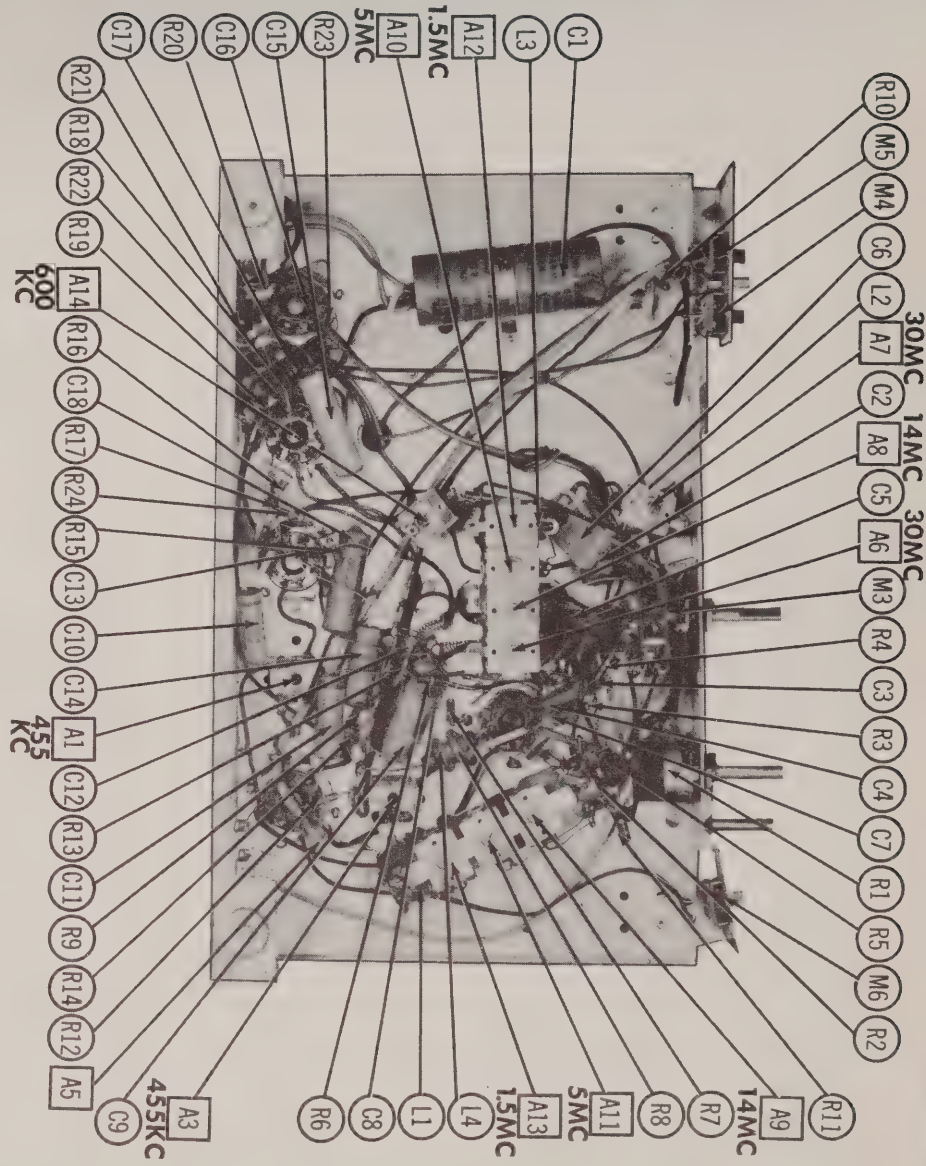
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Hallicrafters PART No.		
M1	Bayonet	6-8	.15	Brown	39A004		Type No. 47.

MISCELLANEOUS

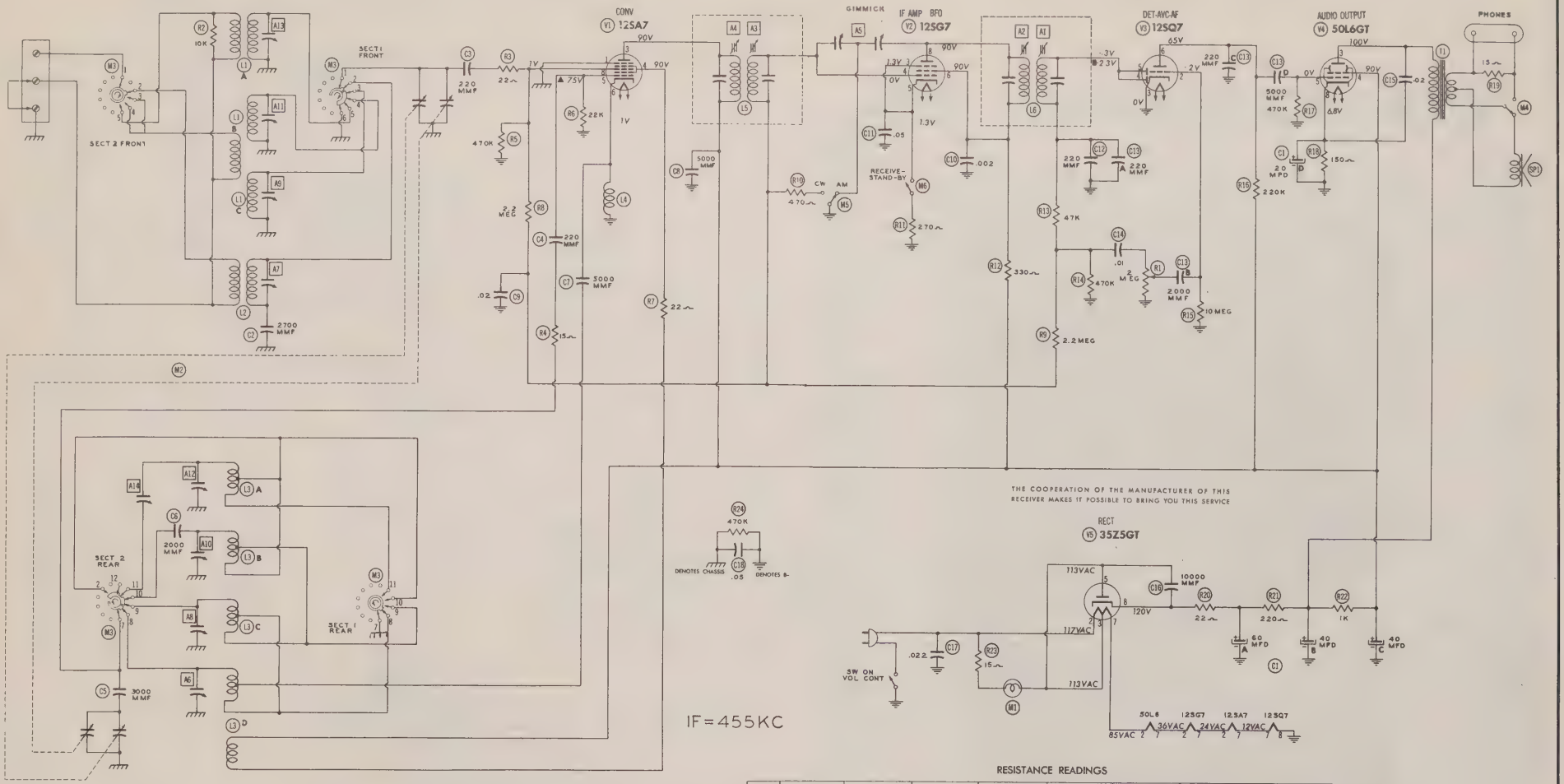
ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M2	Tuning Capacitor	48C162-1	12-461MMF, 12-461MMF
M3	Switch	60C393	Band Selector
M4	Switch	60A477	Speaker-Phones Selector, SPDT Slide
M5	Switch	60A477	AM-CW Selector, SPDT Slide
M6	Switch	60A476	Receiver Standby, SPST Slide
	Cabinet	66C772	
	Back Cover	32C513	
	Bottom Cover	32C501	
	Dial Scale	83C406	
	Dial Window	22B311	
	Pointer	82A216	Bandspread
	Pointer	82A217	Tuning
	Knob	15A049	Band Selector and Off/on Volume (2 Used)
	Knob	15A048	Tuning and Bandspread (2 Used)

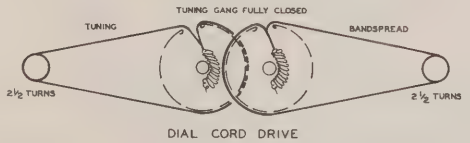
CHASSIS—BOTTOM VIEW



HALLICRAFTERS MODEL S-38C (Run 2)

HALLICRAFTERS MODEL S-38C (Run 2)





DIAL CORD DRIVE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	470KΩ	24Ω	†1.2KΩ	†1.2KΩ	22KΩ	9Ω	12Ω	430KΩ ■390KΩ
V 2	12SG7	470KΩ	36Ω	270Ω	1.3Meg ■470Ω	270Ω	†1.6KΩ	24Ω	†1.6KΩ
V 3	12SQ7	470KΩ	10 Meg	0Ω	477KΩ ■437KΩ	477KΩ ■437KΩ	†220KΩ	12Ω	0Ω
V 4	50L6GT	INF	84Ω	†400Ω	†1.2KΩ	470KΩ	0Ω	36Ω	150Ω
V 5	35Z5GT	INF	118Ω	113Ω	110Ω	113Ω	0Ω	84Ω	1.2Meg

ALL MEASUREMENTS TAKEN IN "BAND 1" POSITION
ALL MEASUREMENTS TAKEN IN "AM" POSITION UNLESS OTHERWISE SPECIFIED
■ MEASURED IN "CW" POSITION
† MEASURED FROM PIN 8 OF V5
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

OPERATING AND SERVICE INSTRUCTIONS

COMMUNICATIONS RECEIVER MODEL S-38D

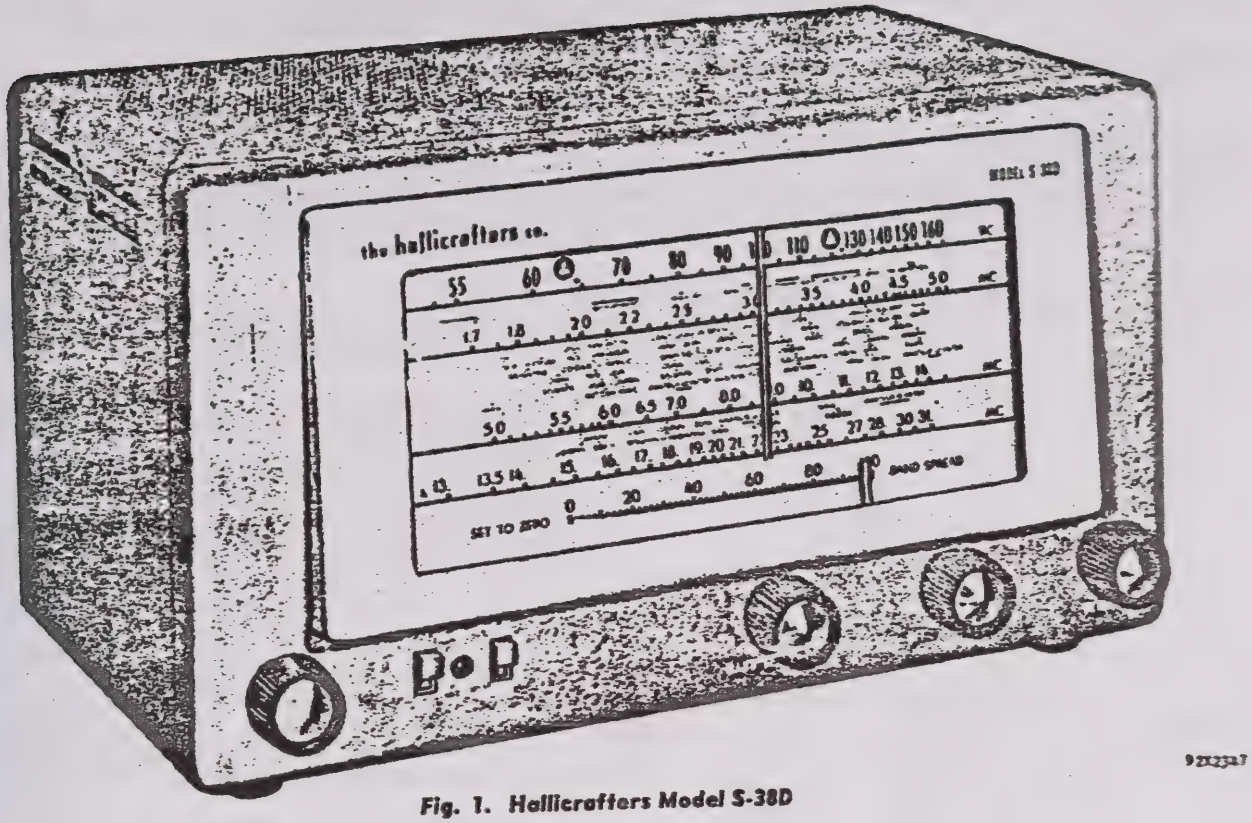

Fig. 1. Hallicrafters Model S-38D

GENERAL DESCRIPTION

Your new Hallicrafters Model S-38D tunes from 540 kilocycles to 31 megacycles to bring you the finest in world-wide radio reception. You'll hear foreign and domestic shortwave broadcasts, amateurs, police, aircraft, ships, and countless other exciting distant stations ... as well as all your favorite programs on standard broadcast. The receiver employs 5 tubes in the latest type superheterodyne circuit and provides for the reception of AM (voice) and CW (code) signals over its entire tuning range. It is designed to operate on 105 to 125 volt AC or DC current.

Good reception is usually possible without an outside antenna or ground and, in most localities, satisfactory results can be obtained with just the 15-foot antenna wire included with your receiver.

Special features in your receiver include an electrical bandspread dial for fine tuning of the amateur and shortwave bands, a powerful built-in Alnico V permanent magnet speaker, provisions for headphone operation, and a receive-standby switch on the front panel that permits you to silence the receiver without turning it off.

IMPORTANT

Your careful attention is especially invited to the installation and operating instructions. They have been provided to insure the satisfaction you have a right to expect from a Hallicrafters "Precision Built" product. Your receiver has an unusually high degree of sensitivity necessary to receive weak and distant stations. Careless operation of a high sensitivity receiver may result in excess noise or background hiss. These undesirable effects can be held to a minimum by careful adjustment of the tuning controls as well as the proper selection and arrangement of the antenna.

INSTALLATION

UNPACKING - After unpacking the receiver, examine it closely for damage which may have occured in transit. Should any sign of damage be apparent, file a claim immediately with the carrier stating the extent of damage. Carefully check all shipping labels and tags for instructions before removing or destroying them.

LOCATION - The receiver is equipped with rubber feet for table or shelf mounting. When locating the receiver, avoid excessively warm locations such as those near radiators and heating vents. Allow at least an inch or two of clearance between the back of the receiver and wall for proper ventilation.

POWER SOURCE - The receiver is designed to operate on 105 to 125 volt AC or DC current. If in doubt about your power source, contact your local power company before plugging in the receiver.

The receiver may also be operated on 210 to 250 volt AC/DC current by using Line Cord Adapter 87D1566, available as an accessory from your Hallicrafters dealer.

HEADPHONES - A twin tip jack, marked "Phones" is provided at the rear of the receiver for connecting headphones or a hearing aid. The headphone output impedance is not critical and any commercial headphones may be used, including crystal types since no direct current flows in the headphone circuit. For maximum headphone output, the use of low-impedance headphones ranging from 50 to 5000 ohms is recommended. For headphone operation, set the Speaker-Phones selector switch at the rear of the receiver at "Phones".

ANTENNAS - The r-f input of the receiver is designed to operate from either a single-wire antenna, or a half-wave doublet or other tuned antenna employing a 52 to 600 ohm transmission line. Antenna connections are made to a three-terminal strip at the rear of the receiver marked "A1", "A2", and "G".

Single-Wire Antenna. The simplest antenna and one which will provide satisfactory performance throughout the entire tuning range is a conventional single-wire antenna. In most localities, satisfactory results can be obtained with just the 15-foot antenna wire included with the receiver. It is simply necessary to attach one end of this wire to terminal "A1", connect the jumper link between "A2" and "G", and then run the wire about the room in any convenient manner. (See Fig. 2.)

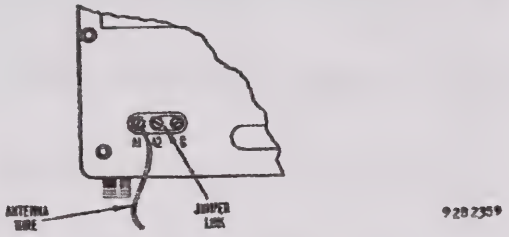

Fig. 2. Single Wire Antenna

If the receiver is operated in a steel constructed building or where receiving conditions are exceptionally poor, an outside antenna 50 to 100 feet long may be necessary. In some locations, reception may be improved by connecting a ground wire (ordinary copper wire) from terminal "G" to a cold water pipe or outside ground rod.

Half-Wave Doublet Antenna. For top performance, especially on the shortwave and amateur bands, the use of a half-wave doublet or other type of antenna employing a 52 to 600 ohm transmission line is recommended. A typical doublet antenna installation is shown in Fig. 3. The doublet antenna should be cut to the proper length for the most used frequency or band of frequencies. The overall length in feet of a doublet antenna is determined by the following formula:

$$\text{Length in feet} = \frac{468}{\text{Frequency in megacycles}}$$

For maximum signal pickup, the doublet antenna should be erected with its length at right angles to the desired station.

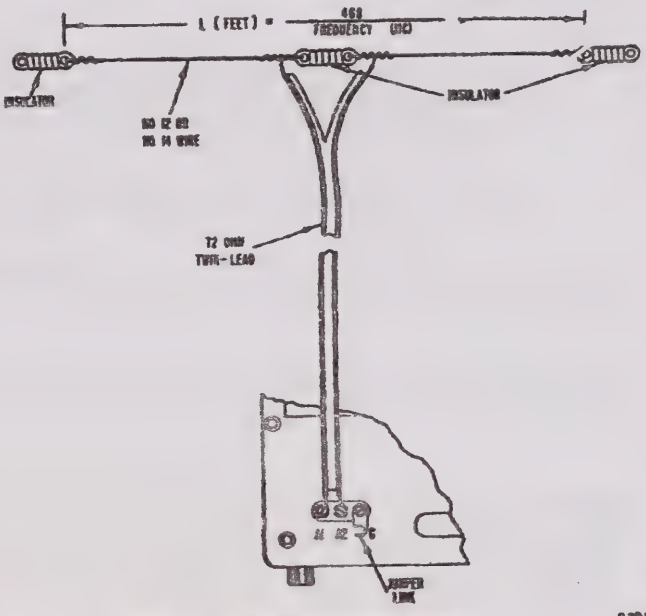

Fig. 3. Doublet Antenna using Twin-Lead Transmission Line

The doublet antenna may be fed with either a balanced or unbalanced transmission line. When a balanced transmission line such as "twin-lead" or a twisted pair is used, the transmission line connects to terminals "A1" and "A2", and the jumper link between "A2" and "G" is disconnected. When using an unbalanced transmission line such as coaxial cable, the inner conductor connects to "A1", the outer metal braid connects to "A2", and the jumper link connects between "A2" and "G". A ground wire may improve reception when using an unbalanced type transmission line.

The doublet antenna provides optimum performance only at the frequency for which it is cut. Therefore, it may be desirable for reception on frequencies remote from the antenna frequency to utilize the antenna as a single wire type. This is accomplished by connecting the two transmission line leads together and connecting them to terminal "A1". The jumper link in this case should be connected between terminals "A2" and "G"

In an installation where the receiver is used in conjunction with a transmitter, it may be advantageous to use the same antenna for receiving as for transmitting. This is especially true when a directive antenna is used since the directive effects and power gain of the transmitting antenna are the same for receiving as for transmitting. Switching of the antenna from the transmitter to the receiver may be accomplished with a double-pole, double-throw antenna changeover relay or knife switch connected in the antenna leads.

For further information regarding antennas, refer to the "Radio Amateur's Handbook" or the "A.R.R.L. Antenna Book", both published by the American Radio Relay League, West Hartford, Conn., U.S.A.

OPERATION

TUNING DIAL - The top dial scale is the standard broadcast band, calibrated in kilocycles minus the last zero. To convert the readings on this band to kilocycles, simply add one zero. For example: 70 on the dial is 700 kilocycles. The shortwave bands are marked 2, 3, and 4. The readings on these bands are in megacycles.

NOTE

The standard broadcast band is marked with a "CD" emblem and a dot at 640 and 1240 kilocycles to indicate the two official civil defense frequencies. In a civil defense emergency, tune to either of these two frequencies for official civil defense news, instructions, and information.

RECEIVE-STANDBY Switch - This switch is normally set at "Receive". When set at "Standby", the receiver is silenced but the tubes remain at operating temperature for instant use. To resume reception at any time, simply return the switch to the "Receive" position.

AM-CW Switch - Set this switch at "AM" to listen to voice or musical broadcasts. Set it at "CW" only if you wish to hear code signals.

BAND SELECTOR Control - Set this control for the band you wish to tune. The four positions of this control correspond to the band numbers at the left side of the dial.

OFF-VOLUME Control - Turn this control clockwise to turn the receiver on and to increase volume. Allow about one minute for the tubes to warm up.

> **IMPORTANT** - When operating on DC (direct current), reverse the power plug in the wall outlet if the receiver does not operate after the one minute warm up. On DC, the receiver will operate ONLY with the plug in one position. When operating on AC (alternating current), try reversing the power plug for minimum hum after the receiver is in operation.

To turn the receiver off, simply rotate the Off-Volume control fully counterclockwise, until a click is heard.

SPEAKER-PHONES Switch - This switch is located at the rear of the receiver. Set it at "Speaker" to operate the built-in speaker or at "Phones" for headphone operation.

TUNING and BANDSPREAD Controls - The Tuning and Bandspread controls are used in conjunction with one another to tune in the desired signal. Wide tuning is performed with the Tuning control and fine tuning with the Bandspread control.

To tune the receiver, set the Bandspread dial pointer at "0" and then slowly turn the Tuning control to the desired station. After the station has been accurately tuned in, reset the Off-Volume control as desired. When trying to locate weak distant stations, it is suggested that the Off-Volume control be initially set near maximum and then readjusted for the desired level after the station has been tuned in. If the signal is too strong, always reduce it by means of the Off-Volume control, not by using the Tuning control. For CW (code) reception, adjust the Tuning control for the desired pitch when tuning in the station.

> **IMPORTANT:** The dial readings will correspond to the station frequencies only if the Bandspread dial pointer is set at "0".

Fine Tuning with the Bandspread Control. The Bandspread control is an electrical fine tuning adjustment for use on all bands. Used in conjunction with the Tuning control, it permits you to accurately tune in stations on crowded bands by spreading them out so they can be more easily separated. The Bandspread control may be used in two different ways.

The first method of tuning is used when it is desired to tune in a single signal with precision accuracy. The Bandspread dial pointer is set at about "5", then the signal is located with the Tuning control, and finally the signal is accurately tuned in by "rocking" the Bandspread control (turning it a few degrees to the left and right) until the signal is loudest and clearest.

The second method of tuning is used when it is desired to tune through a range of frequencies, such as the amateur bands, a group of shortwave stations, etc. Set the Bandspread dial pointer at "0", set the Tuning control for the high end of the selected band or range of frequencies, and then tune through the range with the Bandspread control. Turning the Bandspread control from "0" to "100" tunes the receiver progressively lower in frequency.

Stations of special interest may be accurately logged and relocated by noting the settings of the tuning and bandspread dial pointers and recording them in the station log provided on the back cover.

SERVICE DATA

TECHNICAL SPECIFICATIONS

TUBES	Five including rectifier
SPEAKER	5-inch PM; 3.2-ohm voice coil
HEADPHONE OUTPUT	15 ohms (See "Headphones", page 3)
ANTENNA INPUT	For single wire or 52-600 ohm balanced or unbalanced line
POWER SOURCE	105-125 volts DC or 50/60 cycles AC
POWER CONSUMPTION	30 watts
RECEPTION	AM and CW
INTERMEDIATE FREQUENCY	455 KC
WEIGHT	Net-11 lb., Shipping-13 lb.
DIMENSIONS	13" x 7 1/2" x 8 7/8" deep

TUBE AND DIAL LAMP REPLACEMENT

The dial lamp and tubes are accessible for replacement by removing the cabinet back. For types used and location, refer to Fig. 7.

CAUTION: Before attempting to make any replacement, rotate the Bandspread control fully clockwise and the Tuning control fully counterclockwise to prevent damage to the tuning gang.

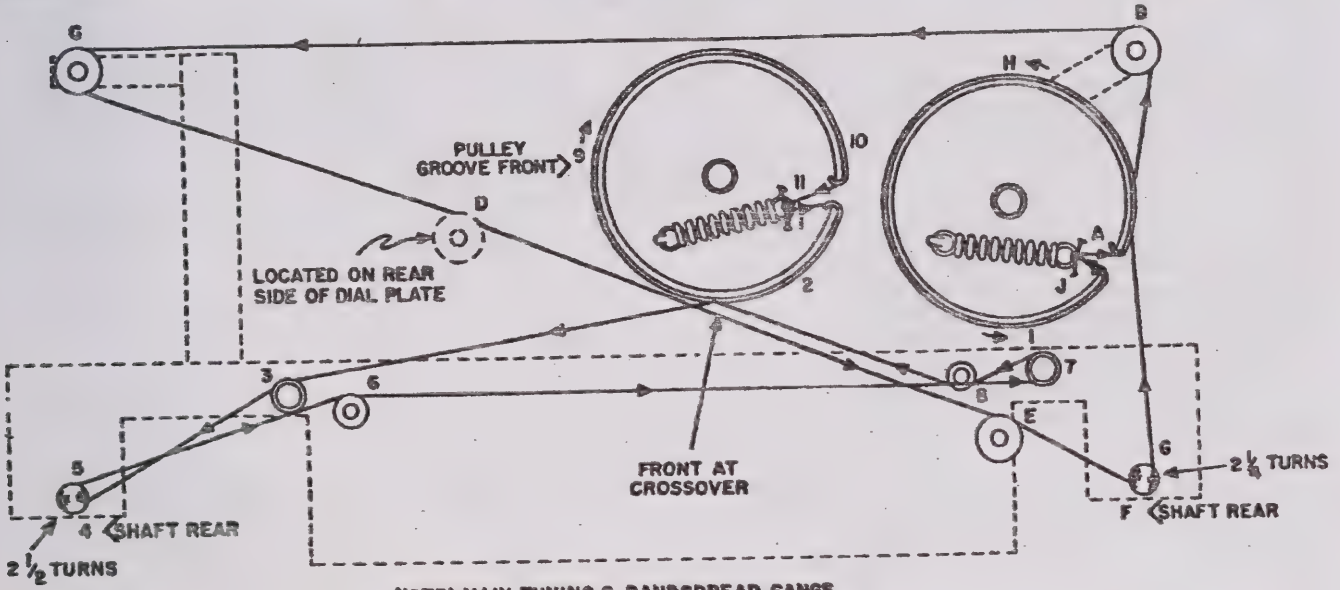

Fig. 4. Main Tuning Pointer Drive and Band Spread Gang and Pointer Drive Stringing Diagrams.

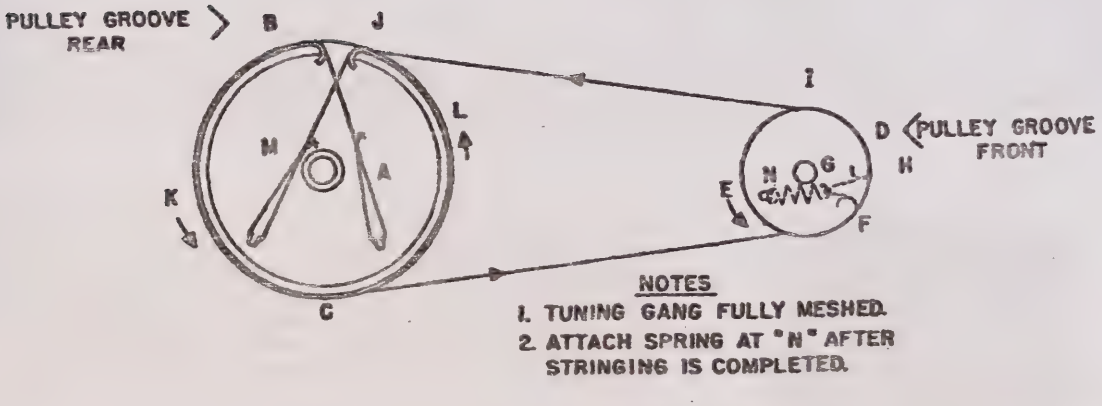

Fig. 5. Main Tuning Gang Drive Stringing Diagram

ALIGNMENT

- Use an amplitude modulated generator covering 455 KC to 30 MC. Use a modulated output for every step except Step 2.
- Connect output meter across speaker voice coil.
- Use a non-metallic alignment tool.
- Set the AM/CW switch at AM, (except for BFO adjustment), SPEAKER/PHONES switch at SPEAKER, VOLUME control at maximum. RECEIVE/STANDBY switch at RECEIVE and the BAND SPREAD control at 0.
- See Figs. 7 and 8 for location of alignment adjustments.

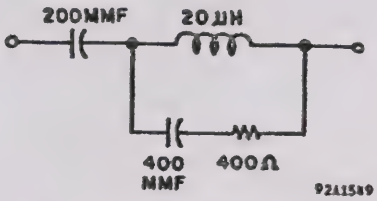

Fig. 6. RTMA Dummy Antenna

Step	Signal Generator Connections	Generator Frequency	Band Selector Setting	Receiver Dial Setting	Adjust
		IF ALIGNMENT			
1	High side thru an .01 mfd. capacitor to stator plates of front section of TUNING gang. Low side to chassis.	455 KC	1	1.0 MC	A, B, C and D for maximum output. Keep reducing gen. output so that the reading on the output meter does not exceed 50 milliwatts.
		BFO ADJUSTMENT			
*2	Same as Step 1.	455 KC (No Mod.)	1	1.0 MC	Set the AM/CW switch at CW. (Reset the switch at AM when Step 2 is completed.) For correct BFO operation, vary the coupling between lead E and pins 4 and 8 of the 12SG7 (V-2) for a maximum beat note. Pushing lead E toward pin 4 increases the strength of the beat.
		RF ALIGNMENT			
3	High side thru RTMA dummy antenna (Fig. 6) to terminal A1 on back of chassis. Low side to chassis. Connect jumper between A2 and G.	30 MC	4	30 MC	F and G for maximum output as in Step 1.
4	Same as Step 3.	14 MC	3	14 MC	H and J for maximum output as in Step 1.
5	Same as Step 3.	5 MC	2	5 MC	K and L for maximum output as in Step 1.
6	Same as Step 3.	1500 KC	1	1.5 MC	M and N for maximum output as in Step 1.
		600 KC	1	.6 MC	P for maximum output as in Step 1.

* Step 2 is usually unnecessary. Adjustment should be made ONLY if a weak beat note is obtained on strong CW signals indicating lack of coupling between wire lead E and pins 4 and 8 of the 12SG7.

SERVICE OR OPERATING QUESTIONS –For any further information regarding operation or servicing of your receiver, contact your Hallicrafters dealer. The Hallicrafters Co. maintains an extensive system of authorized service centers where any required service will be performed promptly and efficiently at a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown at the right. For the location of the one nearest you, consult your dealer or telephone directory.

The Hallicrafters Co. reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate these revisions in earlier models.

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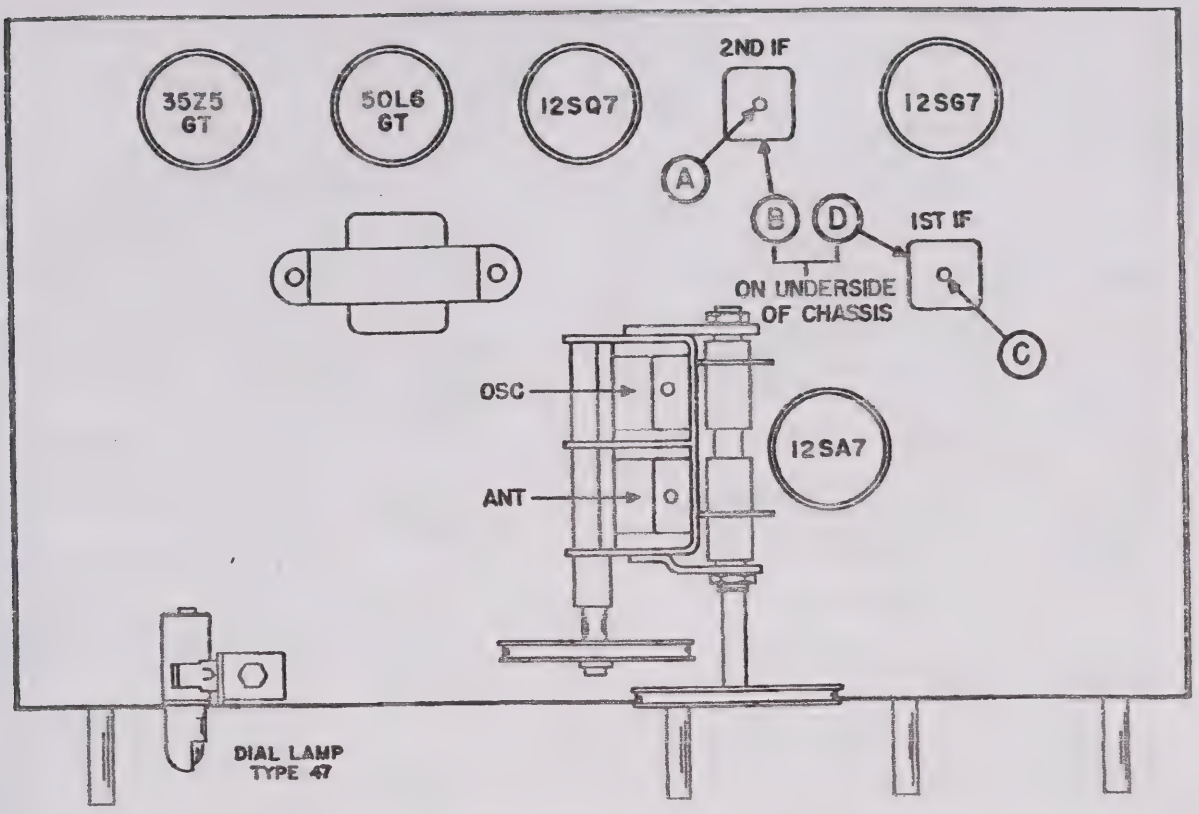


Fig. 7. Top View of Chassis Showing Location of Alignment Adjustments, Tubes and Dial Lamp

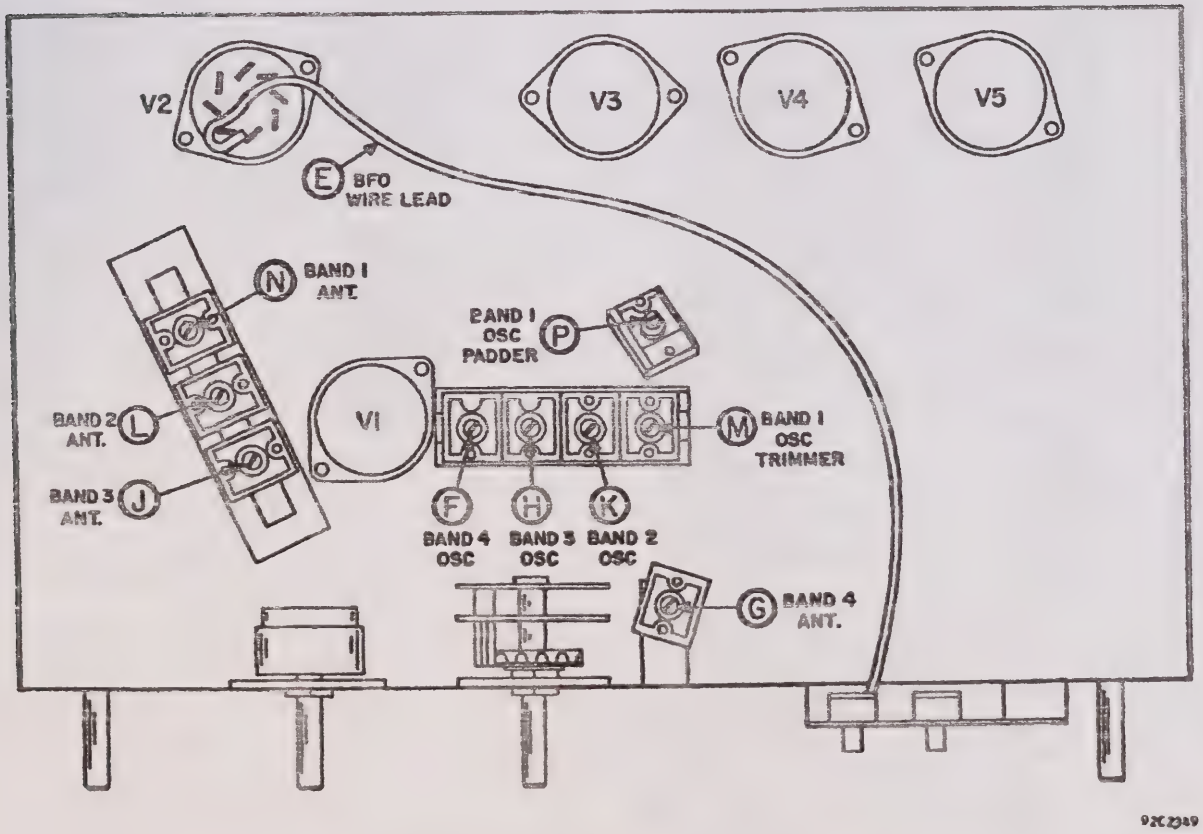


Fig. 8. Bottom View of Chassis Showing Location of Alignment Adjustments and Tubes.

SERVICE PARTS LIST

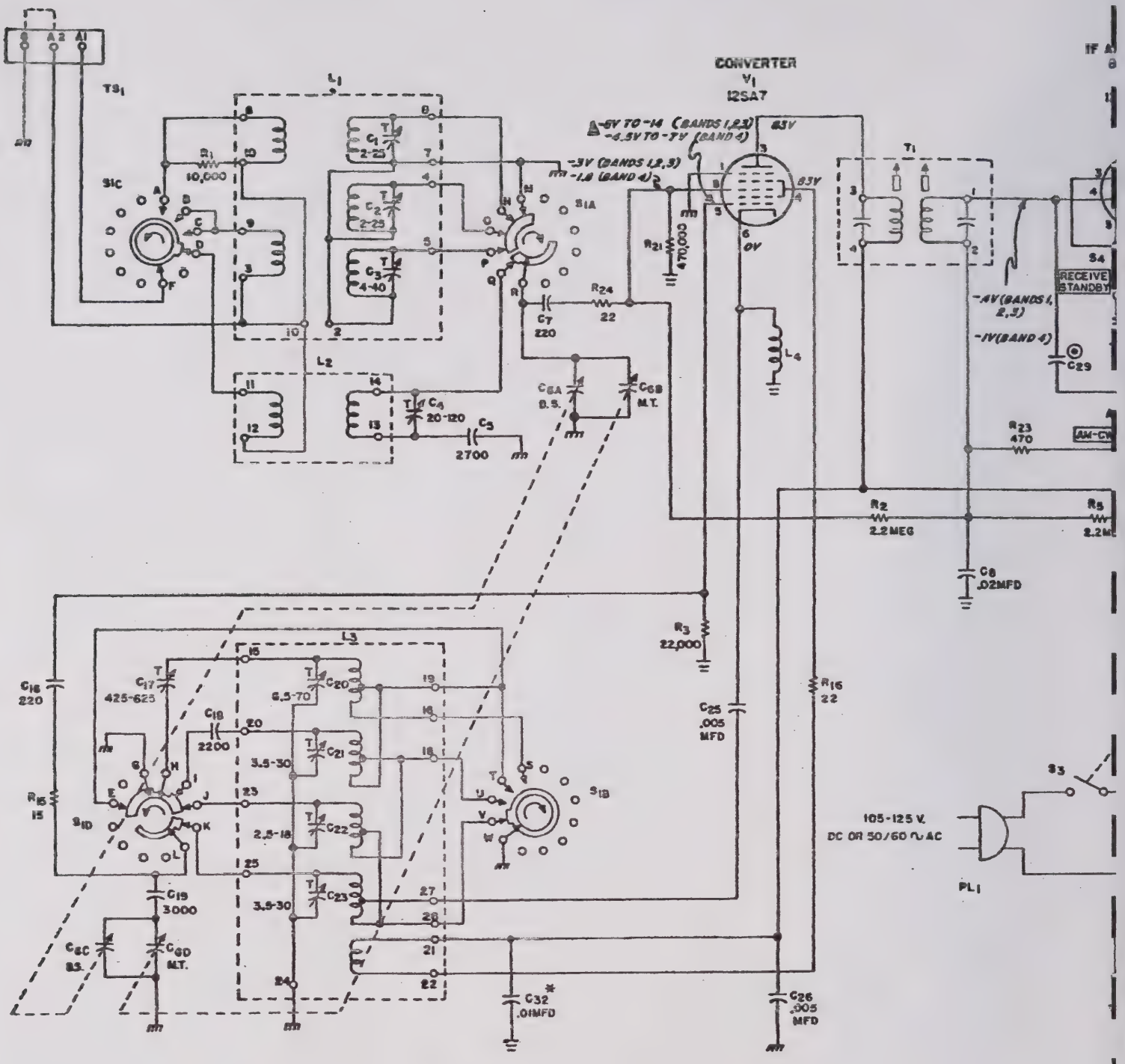
Schematic Symbol	Description	Hallicrafters Part Number
	CAPACITORS	
C-1-2-3	Trimmer assembly, 3 section; 2-25 mmfd., 2-25 mmfd., 4-40 mmfd.	44B129
C-4	20-120 mmfd., mica trimmer	44A424
C-5	2700 mmfd. 5%, 500 V.; mica	47X30B272J
C-6A-B-C-D	Tuning capacitor, 2 section; includes drive pulleys	48-269
C-7,12,16	220 mmfd. 10%, 500V.; mica	47X20B221K
C-8,15	0.02 mfd. 600V., tubular paper	46AY203J
C-9	0.05 mfd. 200V., tubular paper	46AU503J
C-10	0.003 mfd. 600V., tubular paper	46AZ302F
C-11A-B-C-D	Printed circuit capacitor plate, .005 mfd., 220 mmfd., 220 mmfd., .002 mfd.	46A151
C-13	0.01 mfd. 600 V., tubular paper	46AZ103J
C-14A-B-C-D	Filter capacitor, 4 section; 20 mfd. 25V, 60-40-40 mfd, 150V.	45B081
C-17	425-625 mmfd., mica padder	44A349
C-18	2200 mmfd. 5%, 500V.; mica	47X30B222J
C-19	3000 mmfd. 5%, 500V.; mica	47X30B302J
C-20-21-22-23	Trimmer assembly, 4 section; 6.5-70 mmfd., 3.5-30 mmfd., 2.5-18 mmfd., 3.5-30 mmfd.	44B159
C-24	0.05 mfd. 600V., tubular paper	46AY503J
C-25,26,31	0.005 mfd. 450V., ceramic disc.	47A168
C-27	0.02 mfd. 600V., molded tubular paper	46BR203L6
C-28	0.01 mfd. 450V., ceramic disc	47A224
C-32	0.01 mfd. 200V., tubular paper	46AU103J
	*** RESISTORS**	
R-1	10,000 ohms	23X20X103K
R-2,5	2.2 megohms	23X20X225K
R-3	22,000 ohms	23X20X223K
R-4	270 ohms	23X20X271K
R-6	330 ohms	23X20X331K
R-7	47,000 ohms	23X20X473K
R-8,12,21,22	470,000 ohms	23X20X474K
R-9	2 megohms, variable; Volume control (includes on-off switch S-3)	25B896
R-10	10 megohms	23X20X106K
R-11	220,000 ohms	23X20X224K
R-13	100 ohms	23X20X101K
R-14,15,17	15 ohms	23X20X150K
R-16,18,24	22 ohms	23X20X220K
R-19	220 ohms, 1 watt	23X30X221K
R-20	1000 ohms	23X20X102K
R-23	470 ohms	23X20X471K

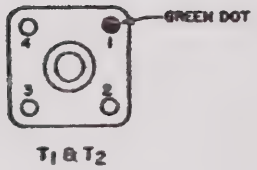
*All resistors are 1/2 watt, 10%, carbon type unless otherwise specified.

	COILS AND TRANSFORMERS	
**L-1, C-1-2-3	Coil and trimmer assembly, antenna; bands 1,2, and 3	51C821
L-2	Coil, antenna; band 4	51B1015
**L-3, C-20-21-22-23	Coil and trimmer assembly, oscillator; all bands	51C822
L-4	Choke, RF; 540 uh	58A107
T-1	Transformer, 1st IF	50C531
T-2	Transformer, 2nd IF	50C532
T-3	Transformer, audio output	55A127

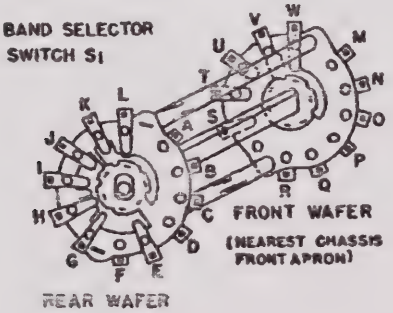
**The trimmer capacitor assemblies are also available separately. See "Capacitors".

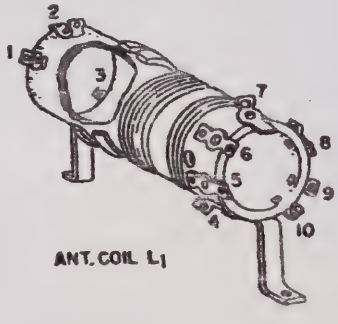
Schematic Symbol	Description	Hallicrafters Part Number
	SWITCHES	
S-1A-B-C-D	Switch, rotary wafer; Band Selector.	60C393
S-2,5	Switch, spdt slide; Speaker-Phones and AM-CW	60A477
S-3	Switch, on-off; part of Volume control R-9	-------
S-4	Switch, spst slide; Receive-Standby	60A476
	SOCKETS AND CONNECTORS	
TS-1	Terminal strip, antenna	88A671
TS-2	Twin jack strip, Phones	88A071
	Socket, dial lamp; with leads	86A122
	Socket, octal tube	6A250
	TUBES AND DIAL LAMP	
V-1	12SA7: converter	90X12SA7
V-2	12SG7: IF amplifier and BFO	90X12SG7
V-3	12SQ7: detector and audio amplifier	90X12SQ7
V-4	50L6GT: audio output	90X50L6GT
V-5	35Z5GT: rectifier	90X35Z5GT
LM-1	Lamp, dial; type 47	39A004
	MISCELLANEOUS	
	Cabinet	66C1070
	Cabinet back	32C500
	Cabinet bottom cover	32C501
	Channel, rubber; for escutcheon glass	16A212
	Clip, dial mtg.	76A646
	Clip, escutcheon glass mtg.	76A645
	Clip, IF mtg.	76A385
	Clip, mtg.; for coil L-2	76A326
	Clip, mtg.; for dial lamp socket.	76A660
	C-washer	4A139
	Dial background, paper	32B679
	Dial cord (specify length)	38A026
	Dial scale	22E426
	Escutcheon, front panel	7C587
	Glass, escutcheon	22B319
	Grommet, rubber; gang mtg.	16A015
	Grommet, rubber; switch bracket mtg.	16A125
	Knob, Band Selector	15B323
	Knob, Bandspread, Off-Volume, and Tuning	15B322
PL-1	Line cord and plug	87A078
	Line cord lock male section	76A397-1
	female section	76A397-2
	Mounting foot, rubber	16A244
	Pointer, dial bandspread tuning	82A198
	main tuning	82A251
	Pulley, 1-13/32" od	28A090
	Pulley, 2.625" od	28A091
	Retaining ring, "E" type (for bandspread idler pulleys)	76A776
	Retaining ring, "E" type (for tuning and bandspread shafts)	76A811
	Shield, dial lamp	8A1249
LS-1	Speaker, 5-inch PM; 3.2 ohm voice coil.	85C030
	Spring, dial drive; 17/32"	75A012
	Spring, dial drive; 3/8"	75A173





T1 & T2



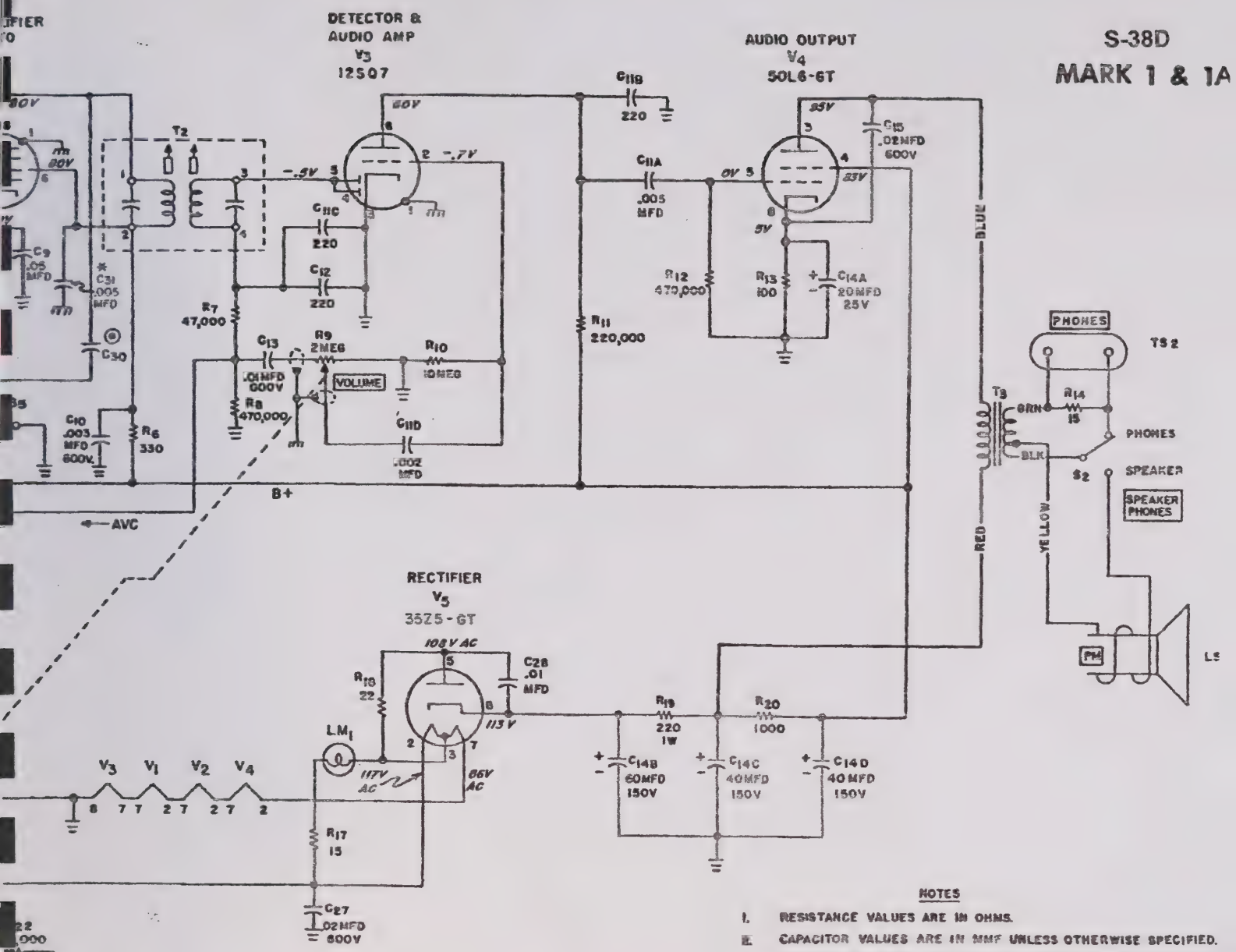


ANT. COIL L1

ANT. COI

NOTE: VALUES & TOLERANCES SHOWN A
IT IS RECOMMENDED THAT THE VA
TO THE NOMINAL VALUE OF THE

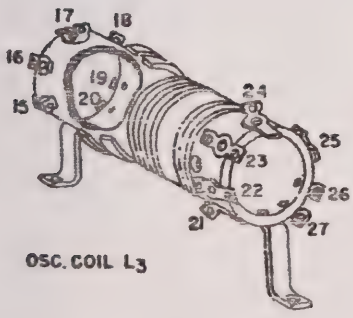
S-38D
MARK 1 & 1A



NOTES

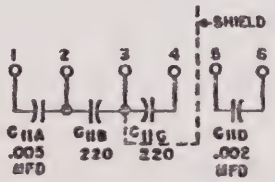
1. RESISTANCE VALUES ARE IN OHMS.
2. CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED.
3. RESISTOR RATINGS ARE 1/2 WATT UNLESS OTHERWISE SPECIFI
4. BAND SELECTOR SWITCH (S1) SHOWN IN BAND 4 POSITION.
- ⏚ B−
- ⏚ CHASSIS
- ◎ WIRE GIMMICK
- # NOT USED ON MARK I SETS.

89E6



OSC. COIL L3

CAPACITOR C11



...INAL AND VARIATIONS MAY BE FOUND.
...Y ANY REPLACEMENT CORRESPOND
...NG REPLACED.

VOLTAGES

1. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND B- (PIN 8 OF 12SQ7) WITH ANTENNA TERMINALS SHORTED, AM/CW SWITCH AT AM, AND RECEIVE / STANDBY SWITCH AT RECEIVE.
2. LINE VOLTAGE- 117 VOLTS AC.
3. ALL VOLTAGES WERE MEASURED WITH A VACUUM TUBE VOLTMETER (VTVM) AND / DC AND POSITIVE UNLESS OTHERWISE SPECIFIED.
- ▲ VARIES WITH TUNING GANG SETTING.

WARRANTY

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extended to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

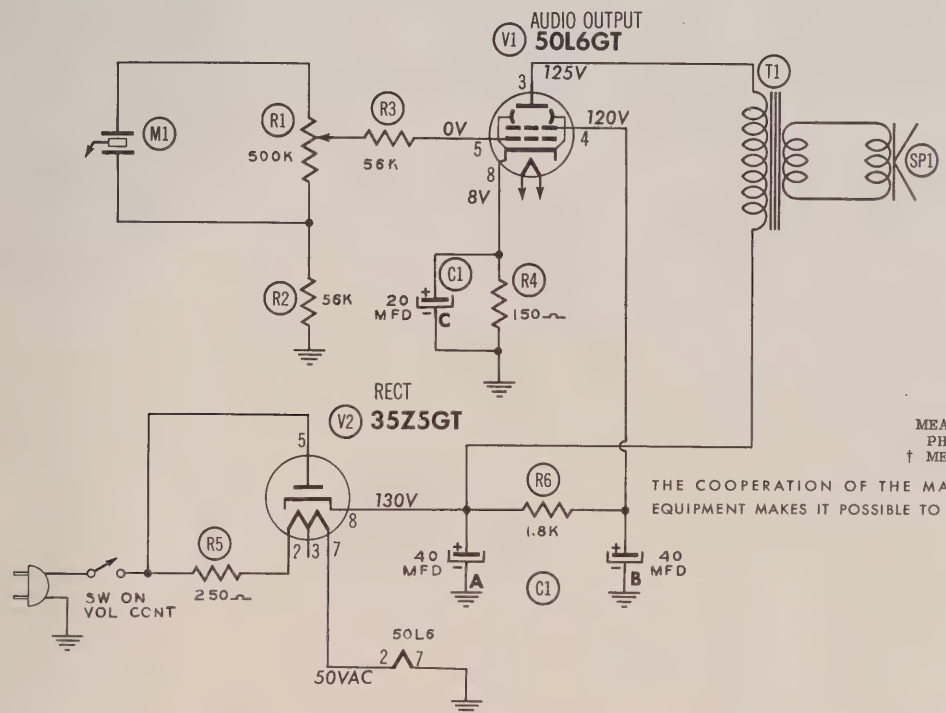
This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

the hallicrafters co.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HUDSON ELECTRONICS
MODEL 310R

TRADE NAME	Hudson Electronics Model 310R
MANUFACTURER	Hudson Elect. Corp., 110 E. Third St., Mt. Vernon, N.Y.
TYPE SET	AC Operated Audio Amplifier With 3 Speed Manual Record Player
TUBES (TWO)	Types 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycle RATING .42 Amp. @ 117 Volts AC



Pin No.	50L6GT Res.	35Z5GT Res.
1	INF	INF
2	47Ω	70Ω
3	†150Ω	66Ω
4	†1.8KΩ	INF
5	112K	31Ω
6	INF	0Ω
7	0Ω	47Ω
8	150Ω	650KΩ

MEASUREMENTS TAKEN WITH PHONO MOTOR CONNECTED.
† MEASURED FROM PIN 8 OF V2

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		HUDSON PART No.	STANDARD REPLACEMENT		
V1	Audio Output	50L6GT	50L6GT	7AC	
V2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	HUDSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	150		AFH3-76		UP4415C		FP311	TVL-3424	
B	▲40	150								
C	20	25								

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HUDSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	BA012-051	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HUDSON PART No.	IRC PART No.	
R2	56KΩ	½		BTS-56K	
R3	56KΩ	½		BTS-56K	
R4	150Ω	½		BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R5	250Ω	7		BTB-1800	
R6	1800Ω	2			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		HUDSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.8KΩ	3.55Ω	150Ω	.4Ω		A-3332 ①	A-2928 ①	RO-2 ①	S-1X ①	① Bend mtg tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	HUDSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.55Ω		ST-113 Mod. P4-X	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	HUDSON PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		L-29 ♦507-L-29		* 92U		60 *2400		* Tone Arm ♦ Complete tone arm and cartridge assembly

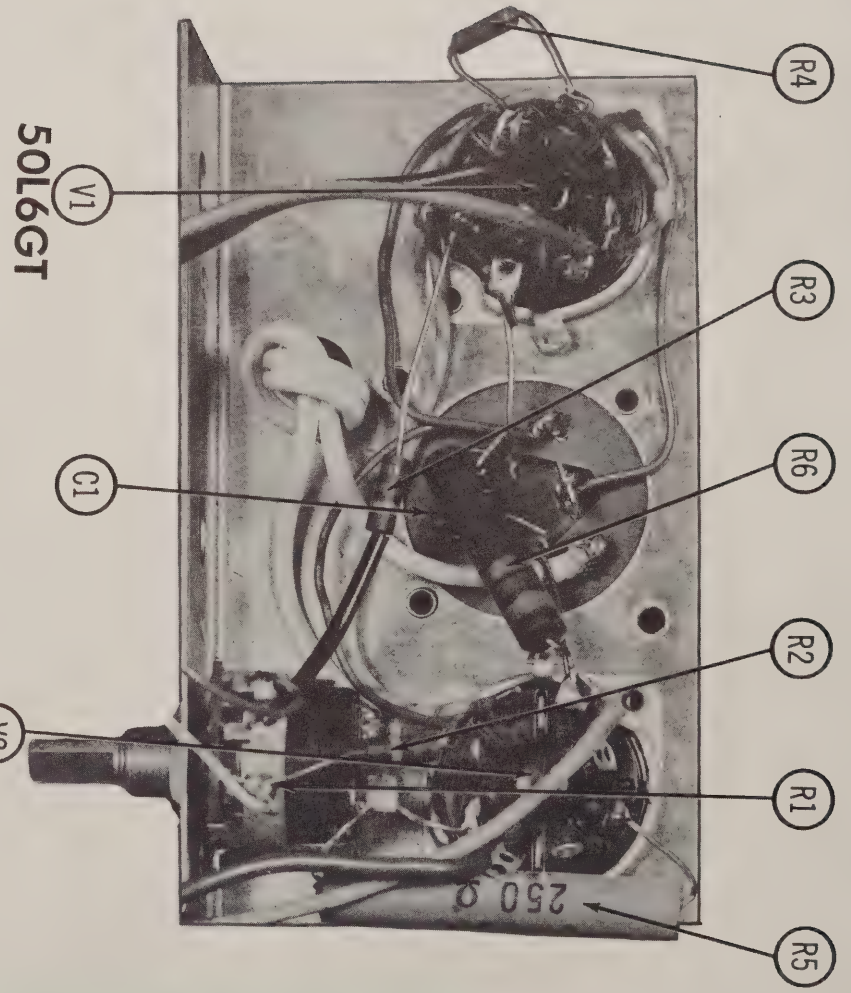
ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HUDSON PART No.	WALCO PART No.	JENSEN PART No.	
M2		WS400-2	J-752 or J-152	

CHASSIS—TOP VIEW



MAGNECORD MODELS
PT6-A, AH, AHX, AX, PT63-A, AH, AHX, AX

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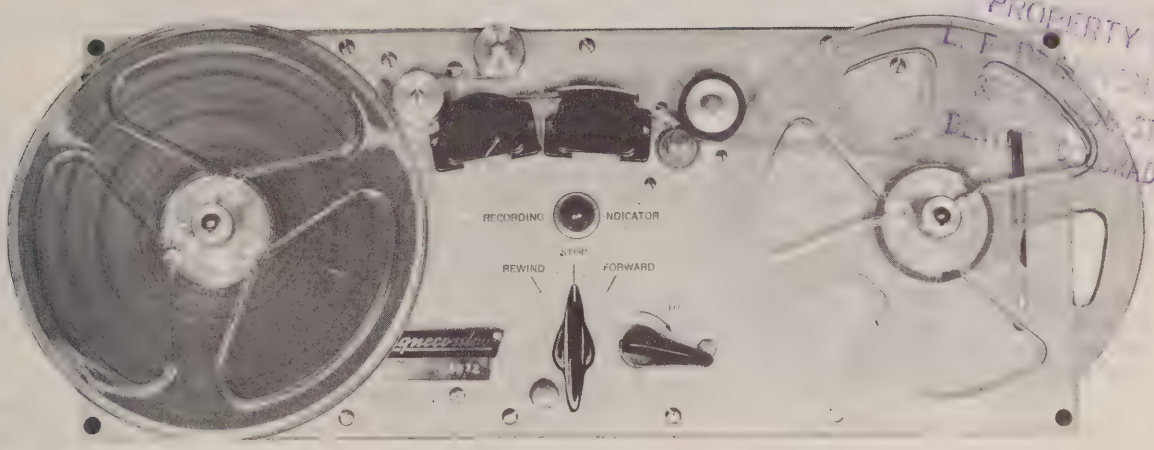

Figure 1

GENERAL INFORMATION

The Magnecord PT6 Series and PT63 Series Tape Recorders are mechanically similar. The PT6 Series is designed for use with the amplifiers and other units of the PT6 Series while the PT63 Series recorder mechanism is designed for use with all PT63 or PT7 Magnecord amplifiers. Other variations are as follows:

PT6-A. Basic recorder in portable carrying case. Includes 15" and 7-1/2" per second capstans and pressure rollers, four mounting bolts, oscillator tube, one empty reel and no connector cables.

PT6-AX. Same as above, less case.

PT6-AH. Same as PT6-A, plus Hi-Speed Forward for fast cueing in. Complete with case.

PT6-AHX. Same as above, less case.

PT63-A. Same as PT6-A, but has three heads for monitoring from the tape. Separate erase, record and playback heads.

PT63-AX. Same as above, less case.

PT63-AH. Same as PT63-A, plus Hi-Speed Forward.

PT63-AHX. Same as above, less case.

These units derive their power from the Magnecord Amplifier used - 117 volt, 60 cycle (or 50 cycle) AC.

Manufactured by:

Magnecord Incorporated
Sales Office: 360 North Michigan Avenue
Chicago 1, Illinois
Plant: 225 West Ohio Street
Chicago 10, Illinois

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Speed Change -

Two sets of capstan-pressure roller combinations are furnished with each unit; the large capstan and small pressure roller provide for 15" per second tape speed and the small capstan and large pressure roller for 7-1/2" per second tape speed, using the standard 1800 rpm motor.

If the recorder mechanism is provided with a two-speed motor (900-1800 rmp) the larger capstan and smaller pressure roller may be used for 15" and 7-1/2" per second, while the smaller capstan and larger pressure roller are used for 3-3/4" and 7-1/2" per second tape speed.

NOTE: When changing speeds, if an equalizer switch is not provided on the amplifier being used, it will be necessary to change equalizers in the amplifier accordingly.

OPERATING INSTRUCTIONS

1 Insert the power cord into a receptacle of the proper rating.

2. Set control knob (44) in the "Stop" position.

3. Before a reel of tape can be placed on the spindle, reel retaining knob (1) must be removed To remove the reel knob, push it in and turn counter-clockwise to release the bayonet pin.

4. Place an empty reel on the right (take-up) spindle (18), and replace the reel retaining knob.

5. Place a reel of tape on the left (rewind) spindle (2).

NOTE: This recorder uses Type "A" wound tape i.e. the dull magnetic coated side faces inward. If the tape to be used is Type "B" (coated side facing outward), place the reel of tape on the right (take-up) spindle (18) so that the tape will lead off in a clockwise direction. Thread the tape on to the left (rewind) spindle (2) as described in paragraph "To Rewind". Place control knob (44) in "Rewind" and allow the full reel of tape to wind on the empty reel. The magnetic side of the tape will now be facing inward.

6. Unwind about 18" of tape and thread it through the normal tape path of the recorder.

7 Insert the end of the tape in one of the radial slots of the take-up reel and wind at least two full turns of tape on to the reel.

To Make a Recording -

1. Turn power switch, on amplifier being used, to "On" This provides the necessary power for both amplifier and recorder mechanism.

2. Place the "Play-Record" control on the amplifier in "Record" position.

3. De-press safety button (42) and, simultaneously, turn control knob (44) to "Forward". This sets the tape in motion.

4. The red bias indicator will glow when the oscillator is operating properly. This indicates a new recording is being made and any previous recording on the tape will be erased.

5. When the recording is completed, turn control knob (44) to "Stop".

To Rewind a Tape -

1. Before rewinding, lift the tape clear of the pole surfaces on the record/playback head and place it on top of the head shield (11). This prevents excessive wear of the pole surfaces during the rewind operation. The balance of the tape may remain in its normal path.

2 The tape may be rewound at any time by placing control knob (44) in "Rewind"

3. Control knob (44) may be turned to "Stop" at any time without danger of tape spillage. These units will rewind 1200 feet of tape (7" reel) in less than forty seconds.

CAUTION: When switching from "Rewind" to "Forward", always pause in the "Stop" position long enough for the tape to come to a complate stop. Failure to do so will result in tape breakage due to the tight grip the capstan and pressure roller exert on the tape when control knob (44) is in "Forward" position.

To Playback a Tape -

NOTE: A PT63 three head assembly contains both a record head and a reproduce head. They should be used for these functions alone. (In PT6 units the head may be used for record or playback as necessary.)

1. Place the "Play-Record" control on the amplifier in "Play" position. If this is not done, the tape will be erased when set in forward motion.

2. De-press safety button (42) and place control knob (44) in "Forward" position.

3. Adjust volume and tone controls to suit.

Hi-Speed Forward -

On units so equipped, the Hi-Speed Forward mechanism is actuated by de-pressing control knob (16). In this position, the tape is driven at a rate of four times the normal capstan or drive speed. It permits fast cueing or editing of any recorded tape. Since the Hi-Speed Forward mechanism is spring loaded, the farther down control knob (16) is pressed, the faster the Hi-Speed Forward action.

MECHANICAL OPERATION

Flywheel and Capstan -

The balanced flywheel and capstan (33), which is driven by two rubber-tired wheels (61), provide a constant speed for the tape.

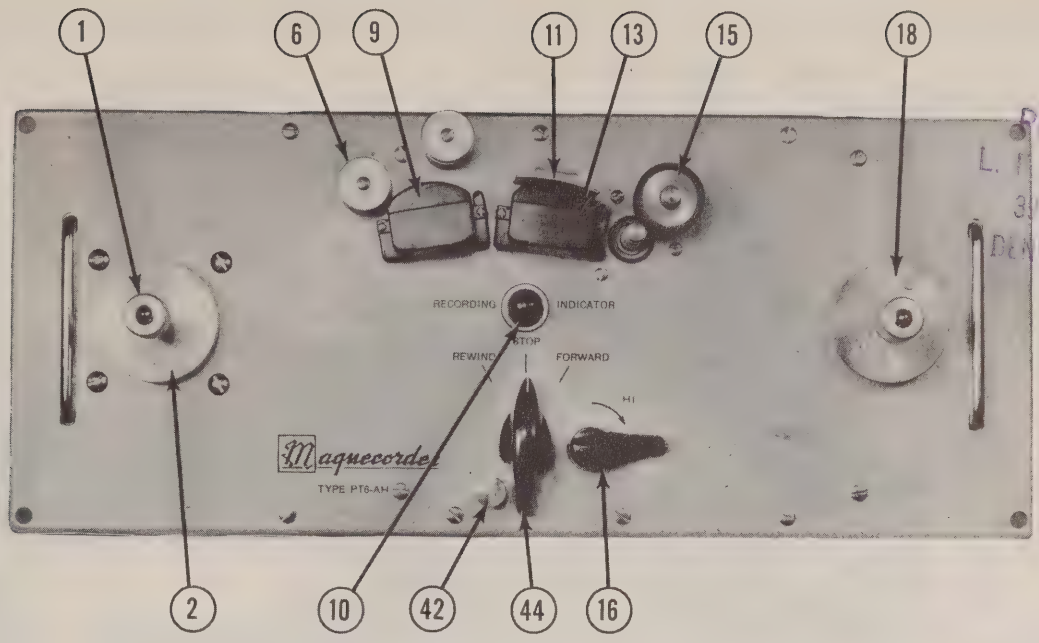

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Figure 2

Pressure Roller -

The pressure roller (15), which is actuated by control knob (44) through the media of switch control shaft (40) and pressure roller pivot bracket (32), keeps a positive pressure against the tape and capstan to aid in maintaining the constant rate of tape travel.

Hi-Speed Forward -

The Hi-Speed Forward is put into operation by pressing the Hi-Speed Forward control knob (16), which, in turn, actuates control shaft and wire (59), pivot arm and wire (69), and the fast forward wheel mounting bracket (72). This pulls the fast forward wheel (73) into contact with the motor drive shaft and the take-up hub and tube (20). Simultaneously, pivot arm (69) moves against the fast forward actuating switch (79), starting the main drive motor (75).

Rewind System -

When control knob (44) is placed in "Rewind", rewind switch (80) is actuated starting the rewind motor (46). A DC operated solenoid is also energized during rewind, which pulls the forward idler wheel (65) away from the take-up hub (22), allowing the ball-bearing mounted take-up shaft (18) to turn freely. When the rewind operation is completed, and control knob (44) is returned to the "Stop" position, the solenoid is de-energized. This allows the forward idler wheel (65) to contact the take-up hub (22) applying a braking force sufficient to stop the reel.

The "one-way" pawl actuated clutch on the rear shaft extension of the rewind motor (46), operates in such a manner so that as the tape is unwound from the rewind spindle (2), a certain amount of drag is imparted to the motor shaft which is then transmitted to the tape as tension. When rewinding, the pawl is disengaged from the ratchet disc (52) by the direction sensitive rewind pawl spring (53) which allows the motor shaft to turn freely. A rapid rewind results.

Take-up System -

The take-up system is driven by the main drive motor (75) through two rubber-tired idler wheels (61), which are mounted on sliding suspension arm supports (60 and 63). Idler wheels (61) are held in contact with the hub of the flywheel (33) and the forward motor shaft (75) by action of springs (64 and 68). This, in turn, drives the capstan (33A), which is secured to the flywheel shaft and, with the use of pinch roller (15), conveys the tape at a constant rate of speed.

The take-up shaft (18) is driven by the forward idler wheel (65), which makes contact with the forward motor shaft and the take-up hub (22). The take-up hub (22) is concentrically mounted on the take-up shaft (18) and is coupled to the shaft through a slipping assembly (20 thru 27) similar to that employed in the rewind system. With tape properly threaded on the recorder and the mechanism in "Forward", the take-up shaft (18) slips a certain amount due to the pressure applied on the tape by the slower running capstan and pressure roller. Consequently, the tension imparted to the tape causes the tape to move from one reel to the other without throwing or stalling.

ADJUSTMENTS

Head Alignment -

The primary purpose in head alignment is to provide the maximum frequency response. For this purpose it is not necessary to adjust the erase head.

NOTE: Before attempting to align the record/reproduce head make certain that the difficulty is not due to an accumulation of tape coating residue on the pole surfaces.

Alignment of PT63 Series Heads -

The head cover is provided with two holes through which a screw driver may be passed in order to adjust the alignment screws. Furthermore, screws provided with lock washers will be found on the bracket assembly which are used to lock the heads in place once they have been aligned. Under no condition should the plastic head cover be removed. The posi-

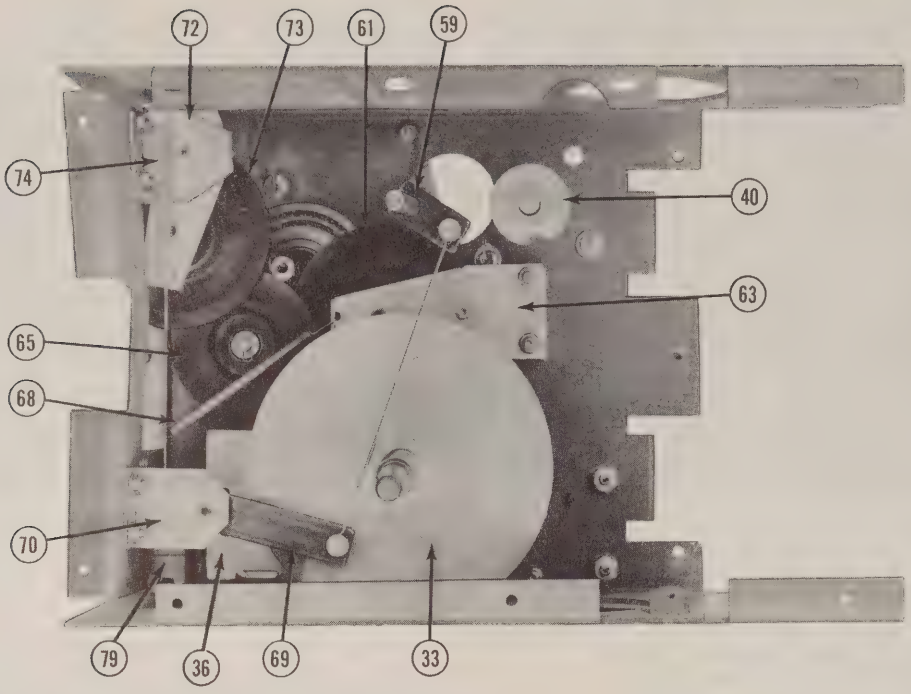


Figure 3

tion of this cover seriously affects the alignment. Using alignment tape, the following procedure should be followed:

1. Loosen the locking screws on the bottom of both record and playback head assemblies.

2. Running the alignment tape over the assembly on "Playback" determines meter reading of the maximum output. It is not necessary, or desirable at this step, that the head be adjusted for maximum output, as will be seen later.

3. Back off on the alignment screws until the playback head is definitely out of alignment. Be sure that backing off on the alignment screws actually allows the head assembly to turn.

4. Lock the playback head assembly in place as in Step 3 by means of the locking screw.

5. With the alignment screw bring the playback head into alignment as noted by the maximum output determined in Step 2.

NOTE: If the alignment screw is turned too far, it will be necessary to repeat Steps 1 through 5.

6. Remove the alignment tape and insert a blank tape which may be used for recording.

7. Repeat Steps 1 through 5 with the unit on "Record" using a frequency similar to that on the alignment tape. Align the record head accordingly.

Alignment of PT6 Series Head -

1. The right mounting screw of the record-reproduce head is drawn up securely. This side of the head holder is provided with a rocker action. The left adjustment screw (12) is associated with a compression spring. Rotating this screw changes the gap alignment with respect to the tape. Proper alignment is achieved when the maximum signal, at a given setting of the gain control is reproduced from the alignment tape, as the alignment screw (12) is turned in or out.

Rewind Drag Adjustment -

Adjustments to this friction drag system are measured by means of a 0 to 1 pound spring scale on one end of a string wound several times around the hub of a 7" reel mounted in the normal manner on the rewind hub. Since the drag is being measured, the string should be wound on the reel to lead off in a clockwise direction and the spring scale should be pulled slowly upward against the friction drag. When properly adjusted, it should take about 4 to 5 ounces to rotate the reel.

Readjust by loosening the socket head set screw (58) in the knurled split nut (57). Then rotate this nut, lock the nut with the set screw after each adjustment and before measuring the result.

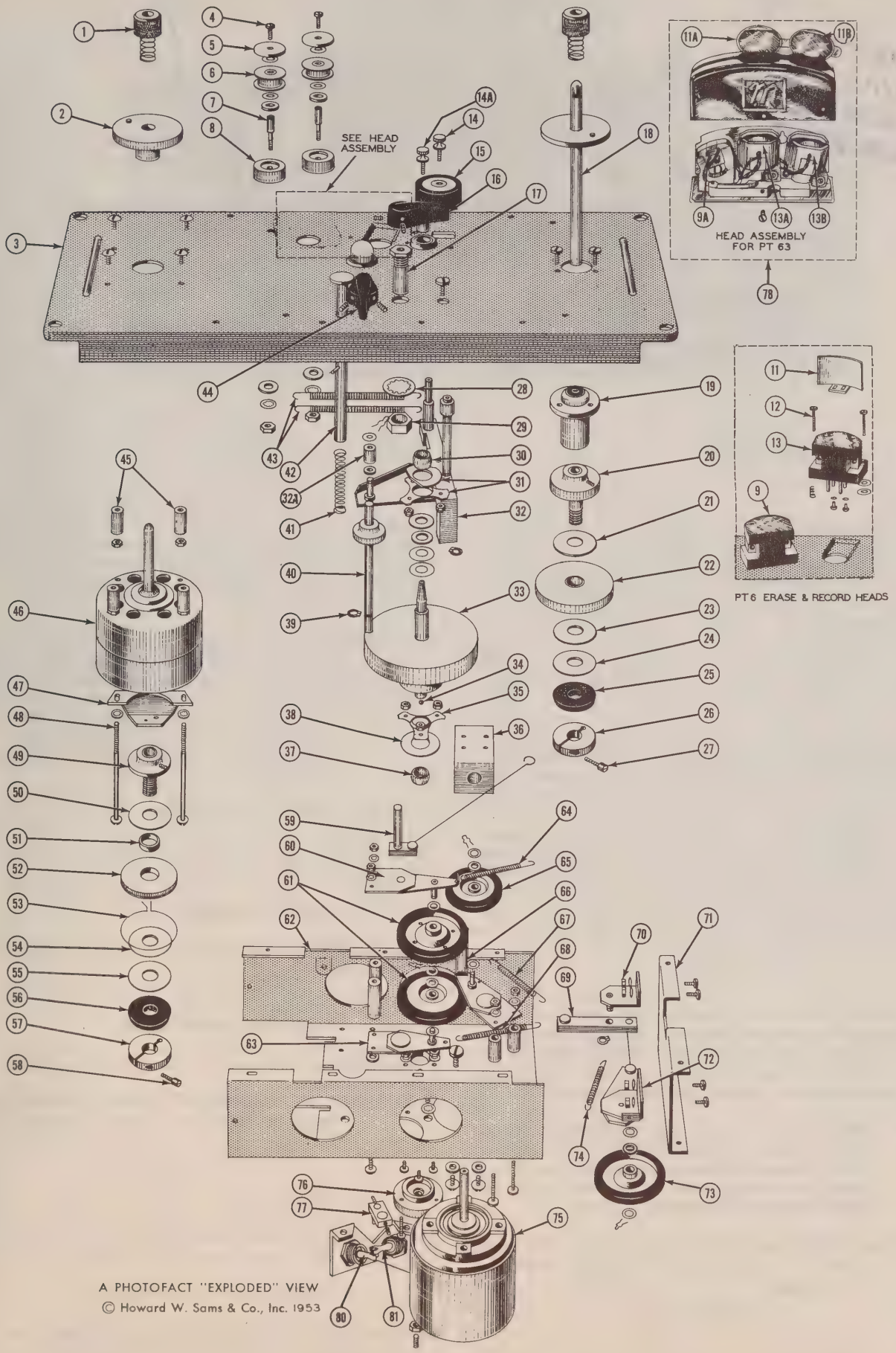
Take-up Torque Adjustment -

The torque transmitted to the take-up shaft should be measured in a similar manner to that described above under "Rewind Drag Adjustment". With the spring scale pulling the string vertically upward, with power on and recorder running forward, a reading of 4 to 5 ounces should be obtained.

The amount of torque is determined by the amount of pressure exerted on the take-up friction wheel (22) by friction felts (21 and 23). Tightening knurled-split nut (26) increases the torque. Always loosen set screw (27) in the split nut before adjusting and retighten before running or measuring.

Solenoid Adjustment -

Solenoid (36) which is energized during rewind, should



A PHOTOFACT "EXPLODED" VIEW

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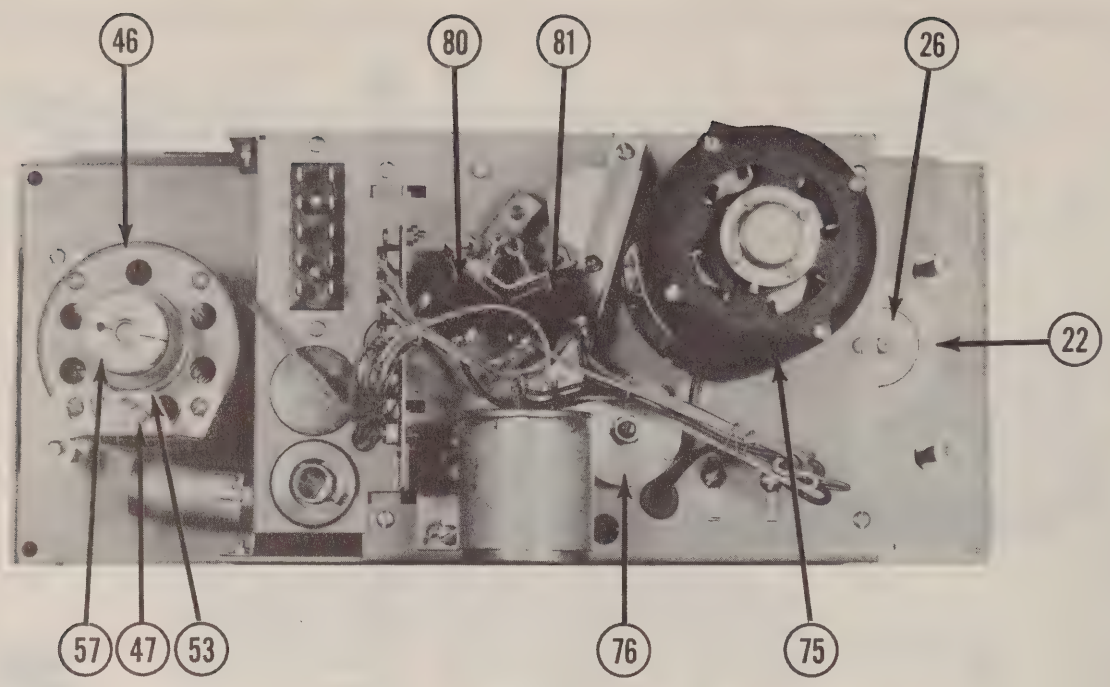


Figure 4

pull against spring (67) and lift idler wheel (65) away from the forward motor shaft by 1/16", but maintain contact between idler wheel (65) and the take-up shaft. When the mechanism is switched from "Rewind" to "Stop" and the solenoid relaxes, spring (67) returns idler wheel (65) to contact with the forward motor shaft. This shaft is not turning and in turn, idler wheel (65) is prevented from turning and thus stops the free rotation of drive wheel (22) which acts as a brake on the take-up shaft.

Solenoid (36) should be positioned so as to accomplish the above results. The solenoid is mounted by means of two screws in slotted holes in the back panel above the forward drive motor. Care should be taken that, when readjusting the solenoid, the plunger does not bind within the tube. To check this, place the recorder with its panel horizontal (reel shafts vertical) and operate the control knob (with power applied to mechanism) between "Rewind" and "Stop". Return spring (67) has adequate tension to return idler wheel (65) to its normal position when there is no binding of the solenoid plunger.

CLEANING

The head assemblies, capstan and pressure roller are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. Use a soft cloth dipped in carbon tetrachloride to clean the head surfaces, capstan, and pressure roller.

NOTE: The binder in the tape is soluble in carbon tetrachloride. Therefore, have the tape off of the machine when cleaning the heads; and be sure that all surfaces are dry of this cleaner before rethreading the tape.

CAUTION: Do not use a brush when cleaning the heads as this could possibly mar the pole surfaces.

LUBRICATION

1. Most moving parts in this recorder are located in "Oilite" bearings, which retain oil over long periods of time. The "Oilite" bearings are kept oil damp by felt pad wicks. The wicks should be oiled, not the shafts or bearings themselves.

CAUTION: Do Not over-oil. Any excess oil seeps to the outer edges of the moving parts causing slippage in the drive mechanism. Should this ever occur, wipe off all parts thus affected with a clean soft cloth which has been dipped in carbon tetrachloride. The drive surfaces must be dry of oil to function properly.

(a) Forward Drive Motor

Two drops SAE #20 oil, front and back bearings every six months.

(b) Capstan Shaft Bearings

Two drops SAE #20 oil, front and back bearings every six months.

(c) Pressure Roller and Tape Guide Roller Shafts

Two drops of Finoil on each shaft, once a month.

CAUTION: It is important that there be no excess on these bearings, or it will be deposited on the tape.

(d) Idler Wheels

Equipped with felt washer at hub. One drop of SAE #20 oil on felt washer every six months.

(e) Rewind and Take-up Clutch

Do not oil unless clutches begin to squeak; then one or two drops of oil on each of two felt pads.

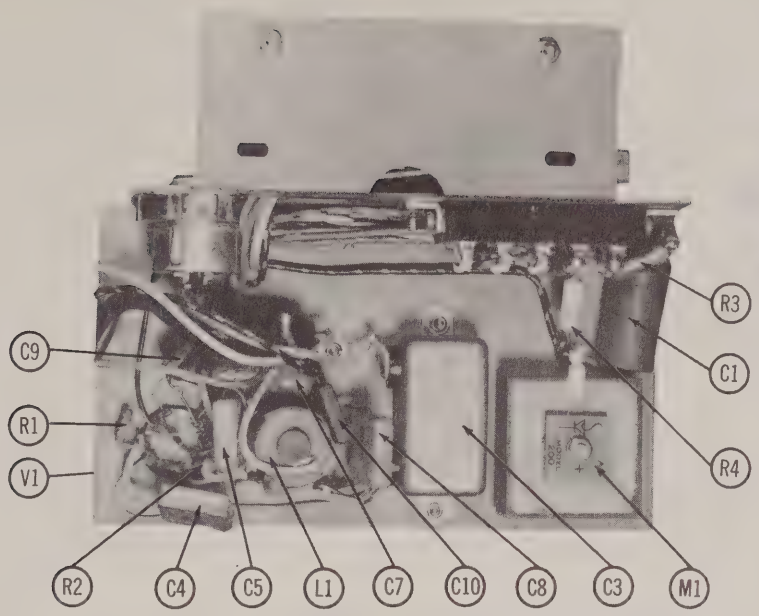
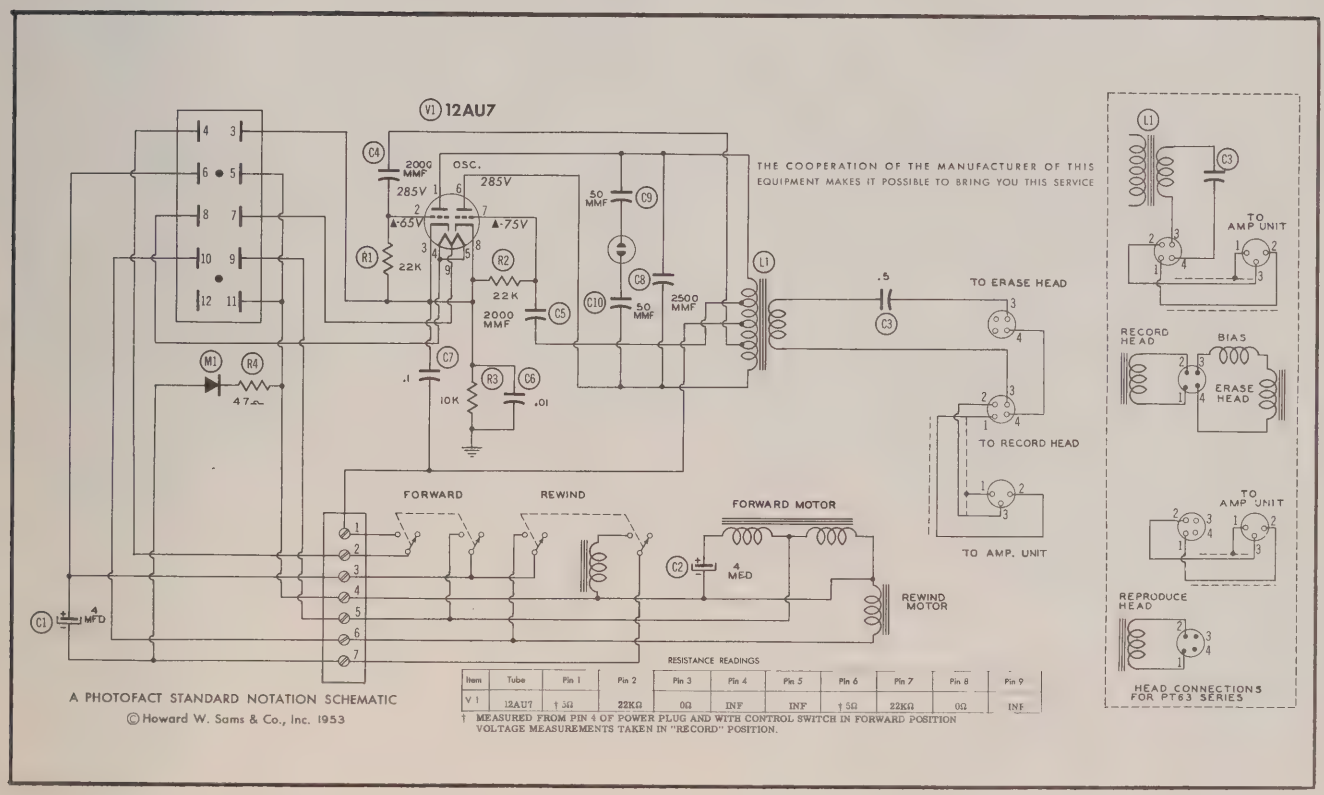


Figure 5


V1 12AU7
OSC.
285V
-65V
-75V
2000 MMF
22K
50 MMF
2500 MMF
.1
10K
.01
47Ω
.5
TO ERASE HEAD
TO RECORD HEAD
TO AMP. UNIT
FORWARD
REWIND
FORWARD MOTOR
REWIND MOTOR
4 MFD
4 MFD
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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RESISTANCE READINGS
Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9
V1 | 12AU7 | † 5Ω | 22KΩ | 0Ω | INF | INF | † 5Ω | 22KΩ | 0Ω | INF
† MEASURED FROM PIN 4 OF POWER PLUG AND WITH CONTROL SWITCH IN FORWARD POSITION
VOLTAGE MEASUREMENTS TAKEN IN "RECORD" POSITION.
TO AMP UNIT
RECORD HEAD
BIAS
ERASE HEAD
TO AMP UNIT
REPRODUCE HEAD
HEAD CONNECTIONS FOR PT63 SERIES

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1		12AU7, Oscillator	C8		Fixed Trimmer, 2500 mmf. ⓐ 500 V
C1		Solenoid Filter, 4 mfd. ⓐ 250 V	C9		Indicator Coupling, 50 mmf. ⓐ 500 V
C2		Motor Starting, 4 mfd. ⓐ 330 V	C10		Indicator Coupling, 50 mmf. ⓐ 500 V
C3		Audio Coupling, .5 mfd. ⓐ 600 V	R1		Oscillator Grid, 22KΩ, 1/2 W
C4		Bias Oscillator Grid, 2000 mmf. ⓐ 500 V	R2		Oscillator Grid, 22KΩ, 1/2 W
C5		Bias Oscillator Grid, 2000 mmf. ⓐ 500 V	R3		Isolation, 10KΩ, 1/2 W
C6		Chassis Isolation, .01 mfd. ⓐ 400 V	R4		Surge Limiter, 47Ω, 1/2 W
C7		Bias Oscillator Decoupling, .1 mfd. ⓐ 400 V	L1		Bias Oscillator Coil
			M1		Selenium Rectifier

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	91A5	Reel Retainer, Knob and Spring
2	91A82	Rewind Flange Assembly
3	71D1	Panel, Only
3A		CARRYING HANDLE ASSEMBLY
	78A7	Chromeplated Handle
	77A1	Handle Spring
	67X1	Handle Spring Cotter Pin
	63X14	Handle Spring Washer
4	614B5	4-40 x 5/16" Roller Mounting Screw
5	63A5	Tape Roller Washer
6	91A9	Tape Guide Roller Assembly
7	76A8	Guide Roller Shaft
8	75A11	Spacer
9	91A17	Erase Head for PT6
9A	91A205	Erase Head for PT63 (See #78)
10	91A13	Recording Indicator plus Lead Wires
11	91A18	Head Shield for PT6
11A	91A112	Record Head Shield for PT63
11B	91A111	Reproduce Head Shield for PT63
12	612F12	Mounting Screw 2/56 x 3/4 Fillister Head
13	91A57	Record-Reproduce Head for PT6
13A	91A187	Record Head for PT63 (See #78)
13B	91A188	Reproduce Head for PT63 (See #78)
14	614K5	Knurled Retainer Screw for Pressure Rollers
14A	614K6	Knurled Retainer Screw for Capstans
15	91A14	60 Cycle Pressure Roller 7-1/2"/ Sec. (Std. Equipment)
	91A15	60 Cycle Pressure Roller 15"/ Sec. (Std. Equipment)
	91A19	50 Cycle Pressure Roller 7-1/2"/ Sec. (Special Order)
	91A20	50 Cycle Pressure Roller 15"/ Sec. (Special Order)
16	87A4	Fast-Forward Control Knob
17	75A37	Fast-Forward Control Shaft Bearing
18	91A53	Take-up Shaft Assembly (Includes Items #19 through #27)
19	91A52	Bearing Housing
20	91A36	Take-up Hub and Tube
21	63A9	Friction Felts
22	91A35	(Includes Items #20 through #27)
23	63A9	Friction Felts
24	63A10	Brass Washer
25	63A11	Rubber Pressure Disc
26	75A70	Knurled Adjusting Nut
27	618C58	8-32 x 1/2" Adjusting Screw
28	63X34	Internal Tooth Lock Washer
29	62-43H20	Locknut for Item 17
30	74A21	Capstan Shaft Bearing
31	63A8	Felt Pad and Bearing Retainer (78A22)
32	91A11	Complete Pressure Arm Assembly
32A	74A13	Roller for Pivot Bracket
33	91A12	Capstan Shaft Assembly
34	78X28	Ball Bearing
35	78A22	Bearing Retainer
35A	624E4	4/40 Elastic Stop
36	31S1	Solenoid (Less Plunger)
37	74A21	Capstan Shaft Bearing
38	63A8	Felt Pad
39	67X13	Tru-Arc Retaining Ring
40	91A32	Switch Control Shaft
41	77A1	Spring for Safety Shaft
42	91A31	Safety Shaft
43	77A6	Tension Springs for Pressure Roller Pivot Bracket
44	87A15	Control Knob
45	75A67	Mounting Spacers
46	91B83	Rewind Motor Assembly
47	91A45	Rewind Pawl and Pawl Bracket
48	6110B6S	Motor Mounting Screws (Supplied with Motor)
49	91A43	Rewind Hub and Tube Assembly
50	63A9	Friction Felt
51	74A70	Bushing
52	75A86	Ratchet Disc
53	77A2	Rewind Pawl Spring
54	63A9	Friction Felt
55	63A10	Brass Washer
56	63A11	Rubber Pressure Disc
57	75A70	Knurled Adjusting Nut
58	61CS8	Adjusting Screw
59	91A379	Fast-Forward Control Shaft and Wire (See Item #69)
60	91A26	Drive Puck Mounting Bracket Assembly
61	91A86	Drive Puck Wheel 2-1/2"
62	71D40	Back Panel
63	91A28	Drive Puck Mounting Bracket Assembly
64	77A4	Tension Spring for Drive Puck (Some Models Use Two Springs in this Application.)
65	91A130	Forward Idler Wheel
66	91A27	Forward Idler Wheel Bracket and Solenoid Plunger
67	77A4	Tension Spring (For Item #65)
68	77A4	Tension Spring (For Item #63) (Some Models Use Two Springs in this Application)
		FOLLOWING NOT SOLD SEPARATELY ORDER COMPLETE 93C3 ASSEMBLY
69		Fast-Forward Pivot Arm
70		Mounting Bracket for Pivot Shaft
71		Main Support Bracket
72		Fast-Forward Wheel Mounting Bracket
73	91A85	Fast-Forward Drive Wheel 2-1/2"
74	77A35	Tension Spring Fast-Forward
75	35B5	Main Drive Motor (1800 rpm)
	22A2	4mf. Condenser for 1800 rmp Motor (Not Shown)
75	35S2	2-Speed Motor (900-1800 rmp)
	22X8	6mf. Condenser for 2-Speed Drive Motor (Not Shown)
76	91A39	Thrust Housing
77	91A30	Switch Control Arm and Pin
78	91A121	PT63 THREE HEAD ASSEMBLY (Heads Not Sold Separately)
	91A205	Erase Head (PT63)
	91A187	Record Head (PT63)
	91A188	Reproduce Head (PT63)
79		Fast Forward Switch
80		Rewind Switch
81		Forward Switch

CAPSTANS (NOT SHOWN IN EXPLODED VIEW)	
75A15	15"/ Sec. Capstan for 60 Cycle AC
75A16	7-1/2" Sec. Capstan for 60 Cycle AC
75A21	15"/ Sec. Capstan for 50 Cycle AC
75A22	7-1/2"/ Sec. Capstan for 50 Cycle AC

PROPERTY OF
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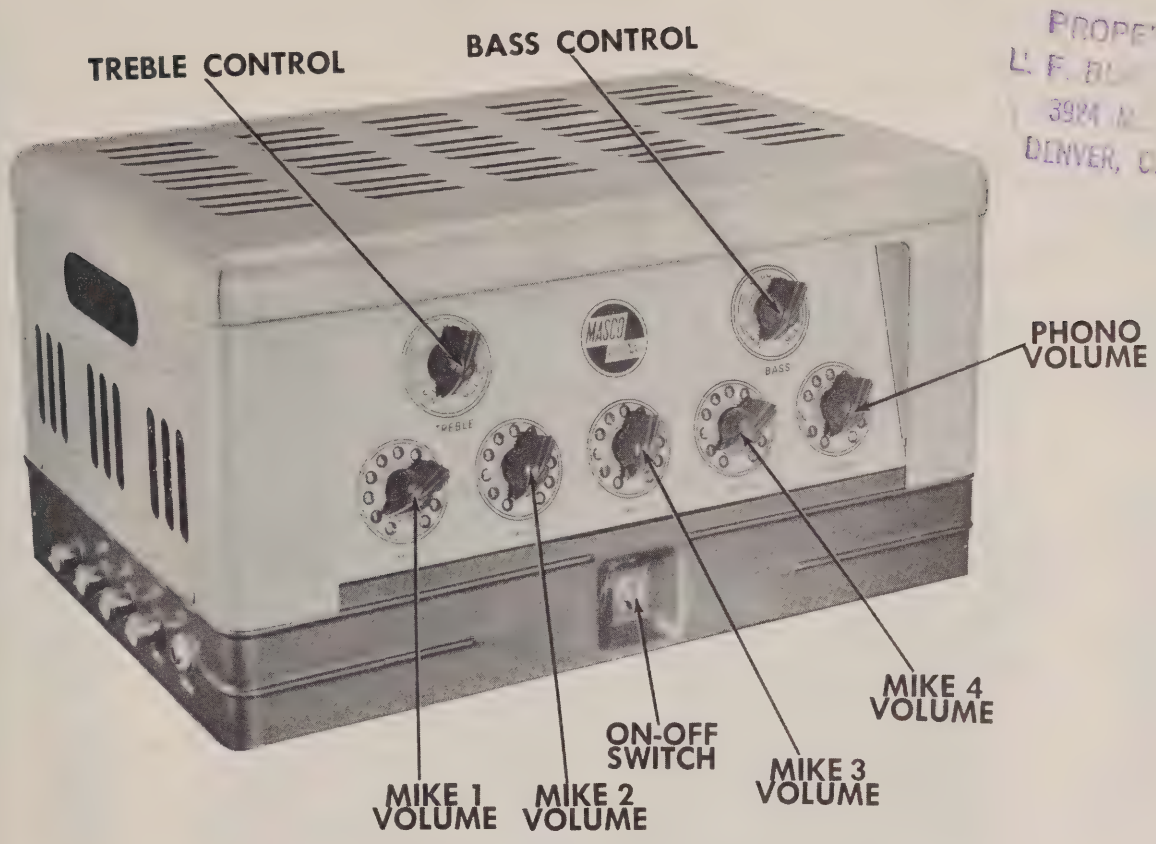

MASCO
MODELS MA-77, MA-77C

MASCO
MODELS MA-77, MA-77C

TRADE NAME	Masco Model MA-77, MA-77R
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City, N. Y.
TYPE SET	AC Operated 5 Channel Audio Amplifier
TUBES (Thirteen)	Types (4) 6J7 Mic. Pre Amp., 6SC7 Mixer-AF Amp., 6SJ7GT AF Amp., 6SL7GT AF Amp.-Phase Inv., 6SN7GT Driver, (2) 807 Audio Output, 5Y3GT LV Rect., (2) 5Y3GT HV Rect.
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.88 Amp. @ 117 Volts AC

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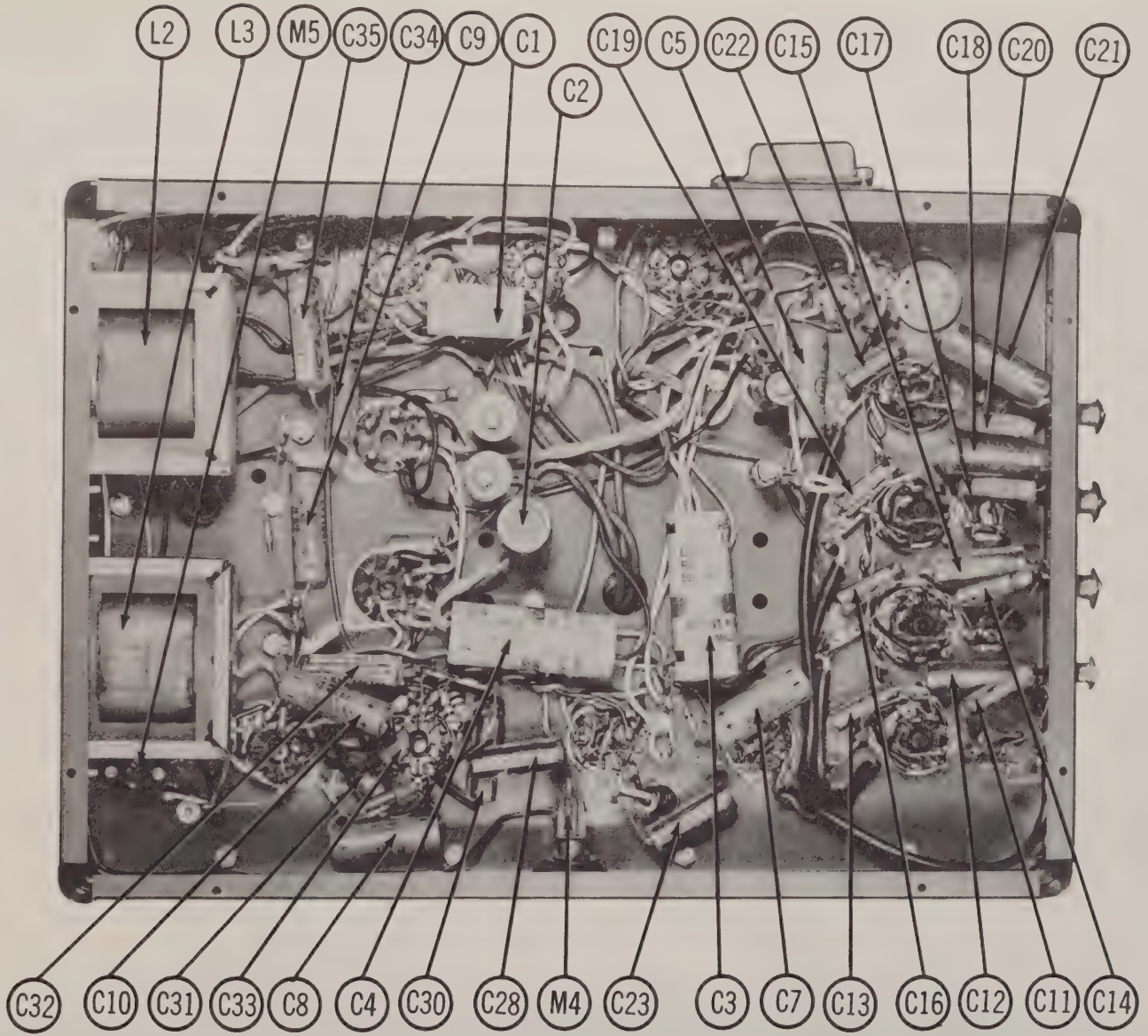
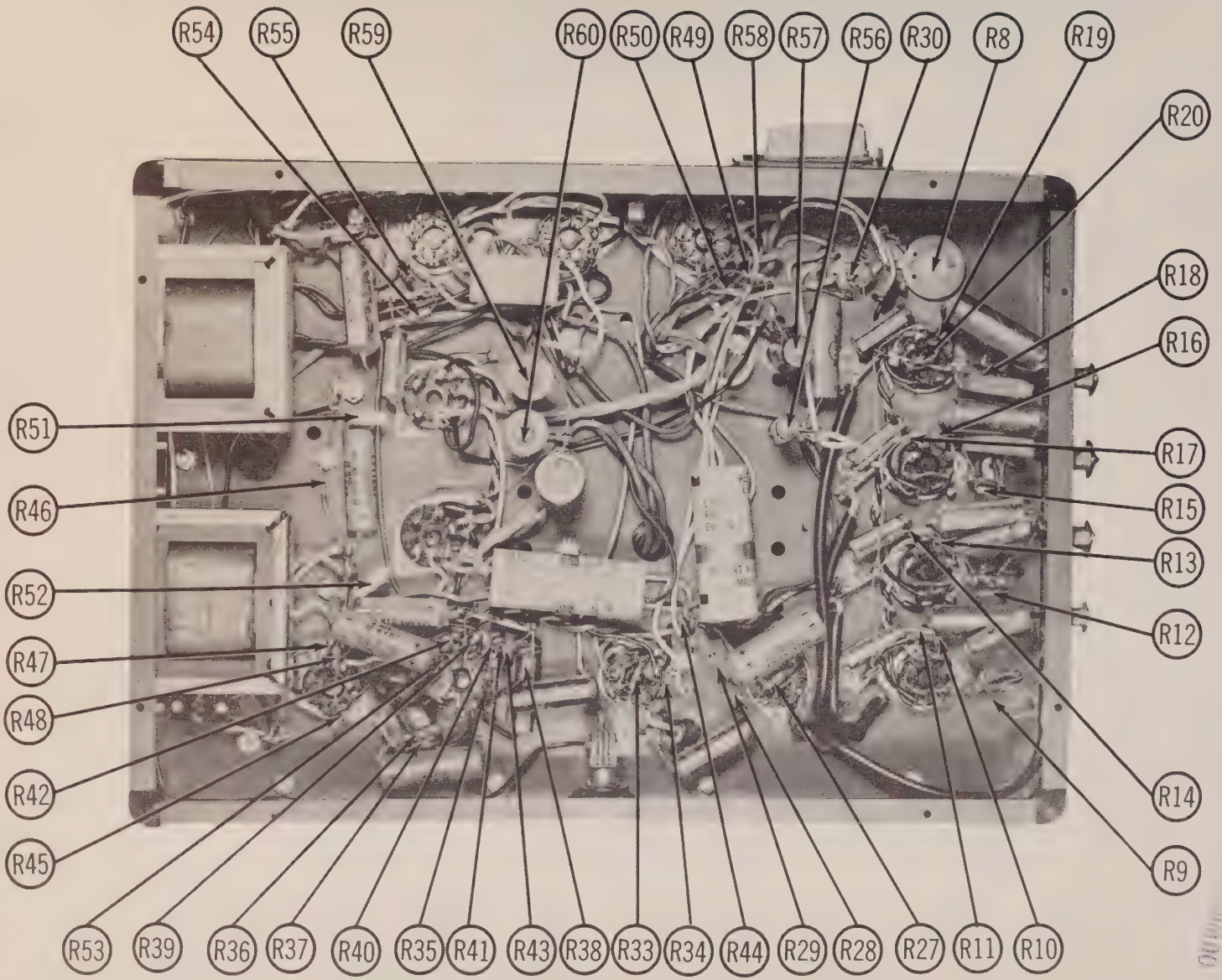
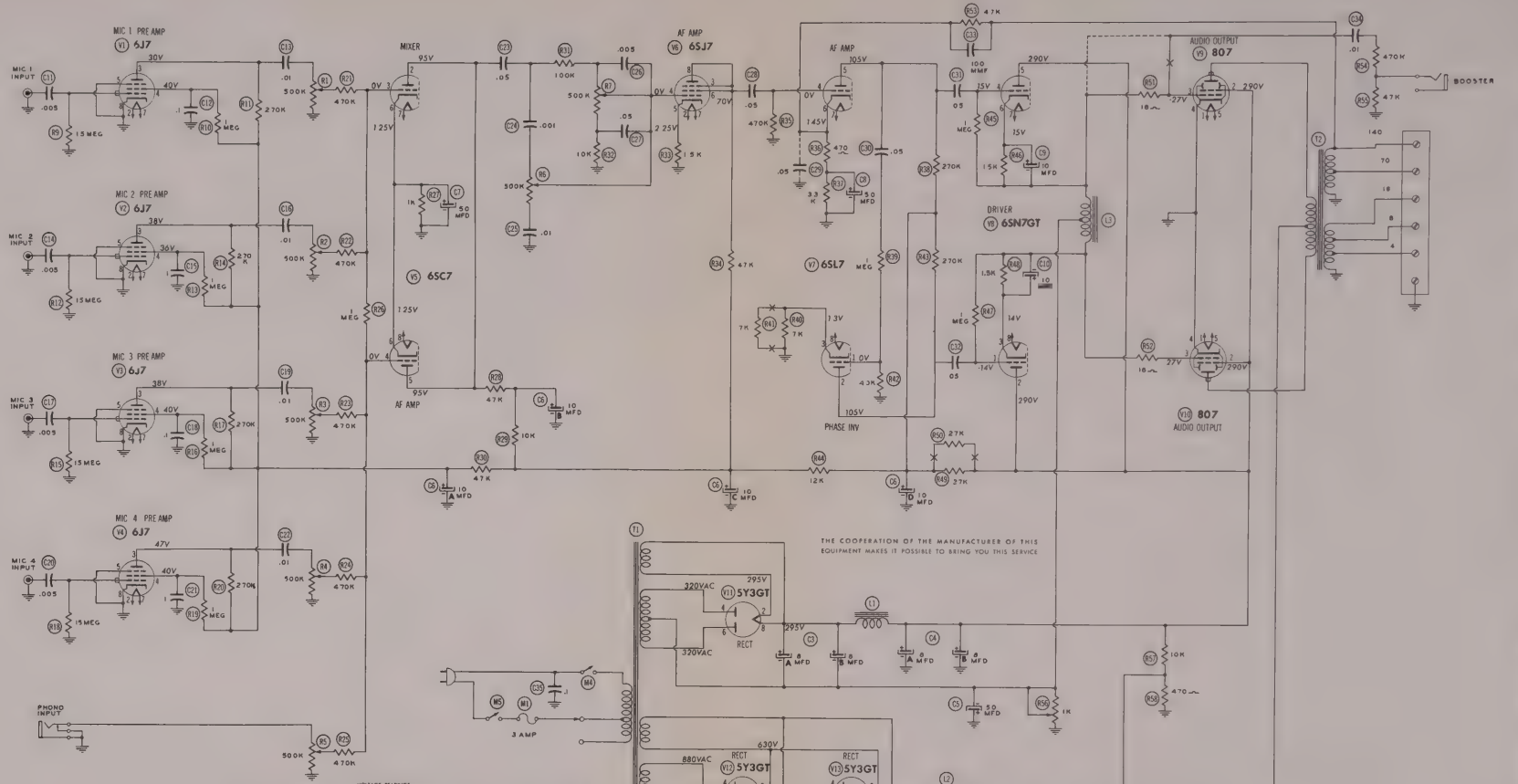


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TOP CAP
V 1	6J7	0Ω	470Ω	† 335KΩ	† 1Meg	0Ω	INF	470Ω	0Ω	1Meg
V 2	6J7	0Ω	470Ω	† 335KΩ	† 1Meg	0Ω	INF	470Ω	0Ω	1Meg
V 3	6J7	0Ω	470Ω	† 335KΩ	† 1Meg	0Ω	INF	470Ω	0Ω	1Meg
V 4	6J7	0Ω	470Ω	† 335KΩ	† 1Meg	0Ω	INF	470Ω	0Ω	1Meg
V 5	6SC7	0Ω	† 82KΩ	220KΩ	110KΩ	† 82KΩ	0Ω	470Ω	470Ω	
V 6	6SJ7GT	0Ω	470Ω	† 72KΩ	105Ω	† 1.5KΩ	† 72KΩ	470Ω	† 72KΩ	
V 7	6SL7GT	60KΩ	† 284KΩ	3.5KΩ	570Ω	† 284KΩ	3.8KΩ	470Ω	470Ω	
V 8	6SN7GT	1Meg	† 55Ω	2.4KΩ	1Meg	† 55Ω	2.4KΩ	470Ω	470Ω	
V 9	807	470Ω	† 55Ω	8800	0Ω	470Ω	—	—	—	#/450
V 10	807	470Ω	† 55Ω	8800	0Ω	470Ω	—	—	—	#/450
V 11	5Y3GT	INF	10.4KΩ	24KΩ	882Ω	INF	884Ω	INF	10KΩ	
V 12	5Y3GT	10KΩ	40KΩ	20KΩ	86Ω	INF	86Ω	INF	40KΩ	
V 13	5Y3GT	40KΩ	40KΩ	INF	80Ω	INF	80Ω	INF	40KΩ	

† MEASURED FROM PIN 8, V11.
# MEASURED FROM PIN 8, V12 & V13.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MASCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	1st Mic. Pre Amp.	6J7	6J7	7R	
V2	2nd Mic. Pre Amp.	6J7	6J7	7R	
V3	3rd Mic. Pre Amp.	6J7	6J7	7R	
V4	4th Mic. Pre Amp.	6J7	6J7	7R	
V5	Mixer - AF Amp.	6SC7	6SC7	8S	
V6	AF Amplifier	6SJ7GT	6SJ7GT	8N	
V7	AF Amplifier - Phase Inverter	6SL7GT	6SL7GT	8BD	
V8	Driver	6SN7GT	6SN7GT	8BD	
V9	Audio Output	807	807	5AW	
V10	Audio Output	807	807	5AW	
V11	Rectifier (LV)	5Y3GT	5Y3GT	5T	
V12	Rectifier (HV)	5Y3GT	5Y3GT	5T	
V13	Rectifier (HV)	5Y3GT	5Y3GT	5T	

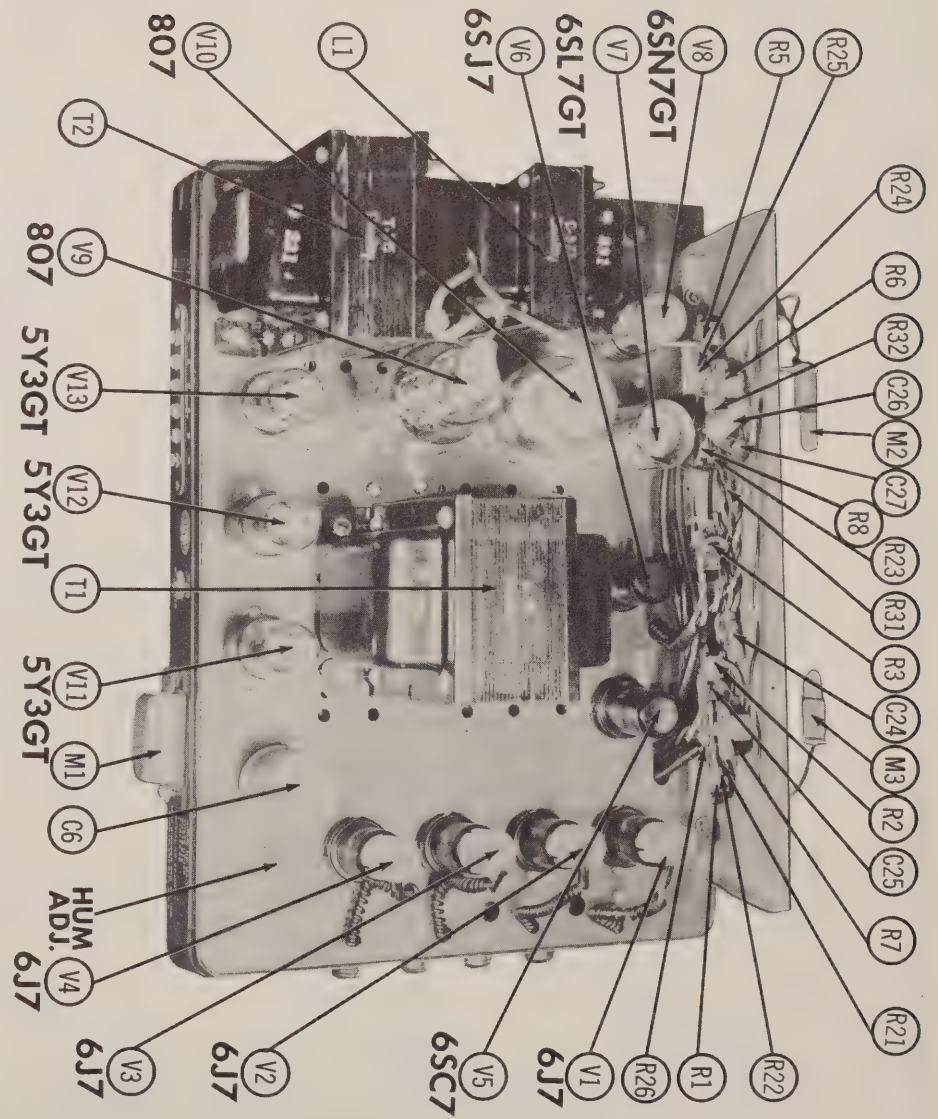
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	8	450		PRS450/8		BR845A		TC71	TVA-1704	
C2	8	450		PRS450/8		BR845A		TC71	TVA-1704	
C3A	8	450		PRS450/8-8		EDL8D45		2N518	TVA-2720	
B	8	450								
C4A	8	450		PRS450/8-8		EDL8D45		2N518	TVA-2720	Note 1.
B	8	450								Note 1.
C5	50	50		PRS50/50		BR505		TC39	TVA-1308	
C6A	10	450		AFH4-10		D009		FP434	TVL-4760	
B	10	450								
C	10	450								Note 2.
D	10	450								
C7	50	50		PRS50/50		BR505		TC39	TVA-1308	
C8	50	50		PRS50/50		BR505		TC39	TVA-1308	
C9	10	50		PRS50/10		BR105		TC32	TVA-1304	
C10	10	50		PRS50/10		BR105		TC32	TVA-1304	
C11	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C12	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C13	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C14	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C15	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C16	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C17	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C18	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C19	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C20	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C21	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C22	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C23	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C24	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C25	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C26	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C27	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C28	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C29	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	Note 4.
C30	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C31	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C32	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C33	100			BPD-0001	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C34	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C35	.1	600		P688-1		PTE6P1		PT601	6TM-P1	Note 3.

Note 1. Some models replace C4A and C4B with 10mfd.
Note 2. Some models use 16mfd in this appliciation.
Note 3. Some models use .05mfd in this application.
Note 4. Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Mike #1 Volume.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not. Req.	Attach to R1A.
R2A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Mike #2 Volume.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A.
R3A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Mike #3 Volume.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A.
R4A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Mike #4 Volume.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R4A.
R5A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Phono Volume.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R5A.
R6A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Bass
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R6A.
R7A	500KΩ	½	33-010-188	Q13-133	AG-60-Z	B-60	U-48	Treble.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R7A.
R8A	50Ω	2		W-50	A43-50	VK-116	R50L	Hum Balance-Wire Wound.
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R9	15Meg	½		BTS-15Meg	
R10	1Meg	½		BTS-1Meg	
R11	270KΩ	½		BTS-270K	
R12	15Meg	½		BTS-15Meg	
R13	1Meg	½		BTS-1Meg	
R14	270KΩ	½		BTS-270K	
R15	15Meg	½		BTS-15Meg	
R16	1Meg	½		BTS-1Meg	
R17	270KΩ	½		BTS-270K	
R18	15Meg	½		BTS-15Meg	
R19	1Meg	½		BTS-1Meg	
R20	270KΩ	½		BTS-270K	
R21	470KΩ	½		BTS-470K	
R22	470KΩ	½		BTS-470K	
R23	470KΩ	½		BTS-470K	
R24	470KΩ	½		BTS-470K	
R25	470KΩ	½		BTS-470K	
R26	1Meg	½		BTS-1Meg	
R27	1000Ω	½		BTS-1000	
R28	47KΩ	½		BTS-47K	
R29	10KΩ	½		BTS-10K	
R30	47KΩ	½		BTS-47K	
R31	100KΩ	½		BTS-100K	
R32	10KΩ	½		BTS-10K	
R33	1500Ω	½		BTS-1500	
R34	47KΩ	½		BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R35	470KΩ	½		BTS-470K	
R36	470Ω	½		BTS-470	
R37	3300Ω	½		BTS-3300	
R38	270KΩ	½		BTS-270K	
R39	1Meg	½		BTS-1Meg	
R40	7000Ω	½			Note 2
R41	7000Ω	½			Note 1
R42	40KΩ	½			
R43	270KΩ	½		BTS-270K	
R44	12KΩ	½		BTS-12K	
R45	1Meg	½		BTS-1Meg	
R46	1500Ω	½		BTS-1500	
R47	1Meg	½		BTS-1Meg	
R48	1500Ω	½		BTS-1500	
R49	27KΩ	½		BTS-27K	Note 3
R50	27KΩ	½		BTS-27K	Note 1
R51	18Ω	½			Note 4
R52	18Ω	½			Note 4
R53	47KΩ	½		BTS-47K	
R54	470KΩ	½		BTS-470K	
R55	47KΩ	1		BTS-47K	
R56	1000Ω	10		1 3/4A-1000	
R57	10KΩ	20		2D-10K	
R58	470Ω	1		BTA-470	Note 5
R59	20KΩ	25		4½E-20K	
R60	20KΩ	25		4½E-20K	

Note 1. Not used in all Models.
Note 2. Some Models use a 3600Ω resistor in this application.
Note 3. Some Models use a 12KΩ resistor in this application.
Note 4. Some Models use a 56Ω resistor in this application.
Note 5. Some Models use a 500Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ 1.88A 125V tap on primary	1760VAC .104ADC	640VCT .06ADC SEC. 4 5VAC @ 2A	5VAC @ 4A SEC. 5 6.3VAC 5.2A	P-75				

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
T2	4.5KCT	140Vtap @ 70V SEC 2 16Ωtap @ 8Ω @ 4Ω	50ΩCT	37.4Ω tap @ 18.8Ω SEC 2 .41Ωtap @ .31Ω @ .24Ω	T-75					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L2	.060A	120Ω	6HY	C-576				
L1	.110A	55Ω	5.2HY	C-235	C-1646			

DRIVER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L3	.014A @ CT	147ΩCT	12HY	C-60				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MASCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGC-3	3A 250 V			312003	351009	AGC-3	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA MASCO PART No.		NOTES
M2	Bayonet	6-8	.25	Blue			Type No. 44.
M3	Bayonet	6-8	.25	Blue			Type No. 44.

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M4	Switch		Off-On, SPST Toggle.
M5	Switch		Safety Interlock, SPST.

PROPERTY OF ELECTRONIC ENGINEERING CO. OF CALIFORNIA

DON McGOHAN MODEL MG-10B

DON McGOHAN MODEL MG-10B

DON McGOHAN MODEL MG-10B

TRADE NAME	Don McGohan Model MG-10B
MANUFACTURER	Don McGohan, Inc., 3700 W. Rossevelt Rd., Chicago 24, Ill.
TYPE SET	AC Operated 3 Channel Audio Amplifier
TUBES (FIVE)	Types 6SC7 Pre-Amp., 6SN7GT AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .59 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

DON McGOHAN
MODEL MG-10B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		Don McGohan PART No.	STANDARD REPLACEMENT		
V1	Pre Amplifier	6SC7	6SC7	8S	
V2	AF Amplifier-Phase Inverter	6SN7GT	6SN7GT	8BD	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Don McGohan PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲30	450		AFH4-69		UP32245C		FP430.2	TVL-3840	
B	■20	450							TVA-1205	
C	▲20	450								
D	20	25								
C2	8	450		PRS450/8		BR845A		TC71	TVA-1704	
C3	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C4	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C5	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C7	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C8	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	Note 1
C9	1000	500		1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C10	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	Note 1
C11	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C12	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C13	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	

Note 1. Some Models use 200MMF in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Don McGohan PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	BA011-301	Q13-133	AG-60-Z	B-60	U-48	Mike Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	BA011-301	Q13-133	AG-60-Z	B-60	U-48	Phono Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	BA013-010	Q19-137X	AT-112	BT-71	UT-443	Treble-Tapped @ 500KΩ
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	BA012-131	Q13-133	AG-60-Z	B-60-X	U-48	Bass
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R4A
C	Switch		Not Req.	Not Req.	SWB	Not Req.	US-26	Attach to R4A

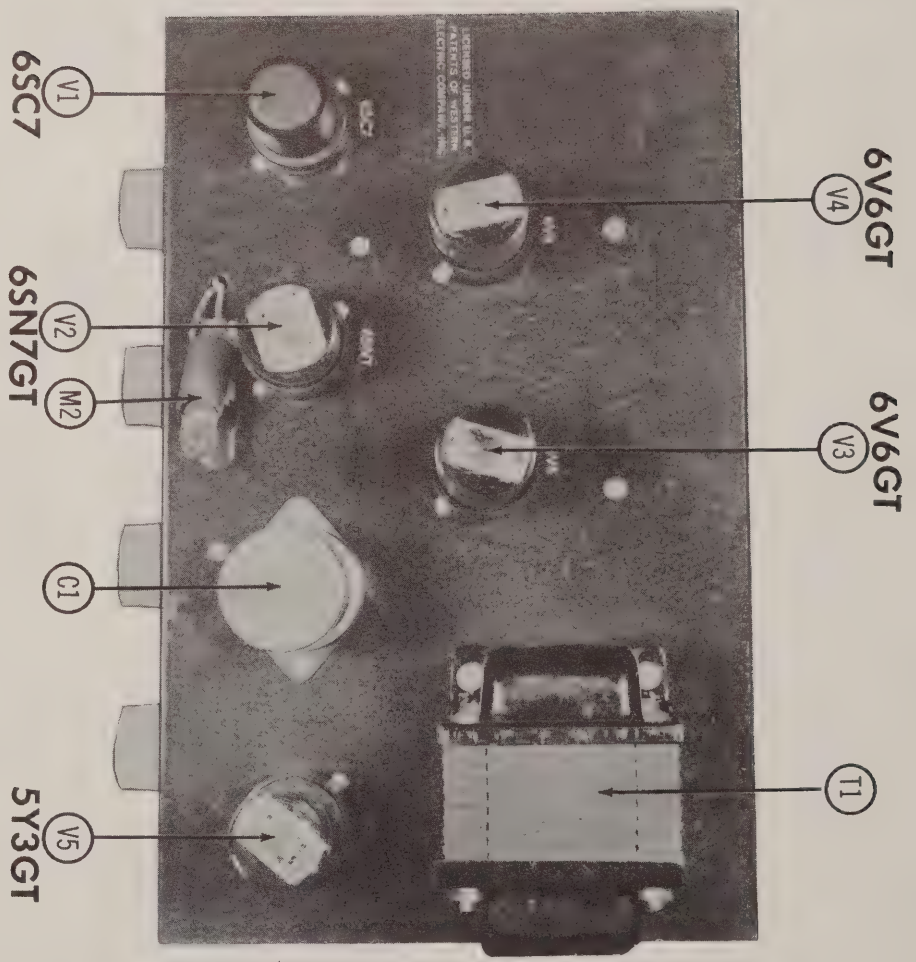
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R5	47KΩ	½		BTS-47K	
R6	100KΩ	½		BTS-100K	
R7	47KΩ	½		BTS- 47K	
R8	4.7Meg	½		BTS-4.7Meg	
R9	560KΩ	½		BTS-560K	Note 1
R10	270KΩ	½		BTS-270K	
R11	20 Meg	½			
R12	560KΩ	½		BTS-560K	Note 1
R13	270KΩ	½		BTS-270K	
R14	180KΩ	½		BTS-180K	
R15	180KΩ	½		BTS-180K	
R16	5600Ω	½		BTS-5600	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R17	560KΩ	½		BTS-560K	Note 1
R18	100KΩ	½		BTS-100K	
R19	47KΩ	½		BTS-47K	
R20	4.7Meg	½		BTS-4.7Meg	
R21	5600Ω	½		BTS-5600	
R22	100KΩ	½		BTS-100K	
R23	100KΩ	½		BTS-100K	
R24	560KΩ	½		BTS-560K	
R25	300Ω	2			
R26	560KΩ	½		BTS-560K	
R27	300Ω	2			

Note 1. Some models use a 500KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V. @ .59A	650VCT .074ADC	5VAC @ 2A	6.3VCT @ 1.8A			P-3152	PV-100 ①	R-11A

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	6.2KΩ CT	500Ω tap @ 16Ω, 8Ω, 4Ω	442Ω CT	88Ω tap @ .64Ω, .48Ω, .36Ω					S-28X	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Don McGohan PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A. 250V.			312002	342001	AGC2	HKP

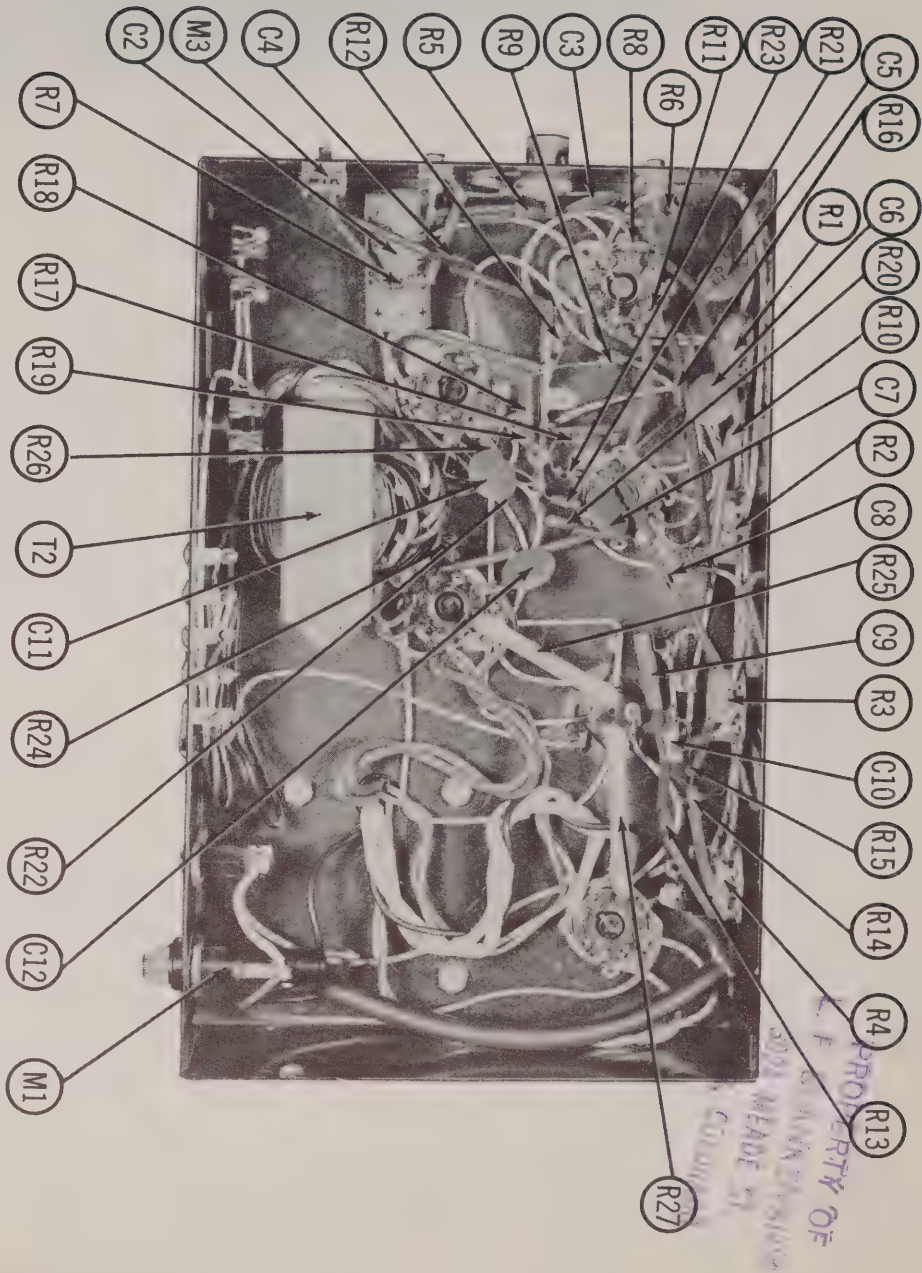
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Don McGohan PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47

MISCELLANEOUS

ITEM No.	PART NAME	Don McGohan PART No.	NOTES
M3	Switch		SP Slide (Magnetic pickup compensator)

CHASSIS—BOTTOM VIEW



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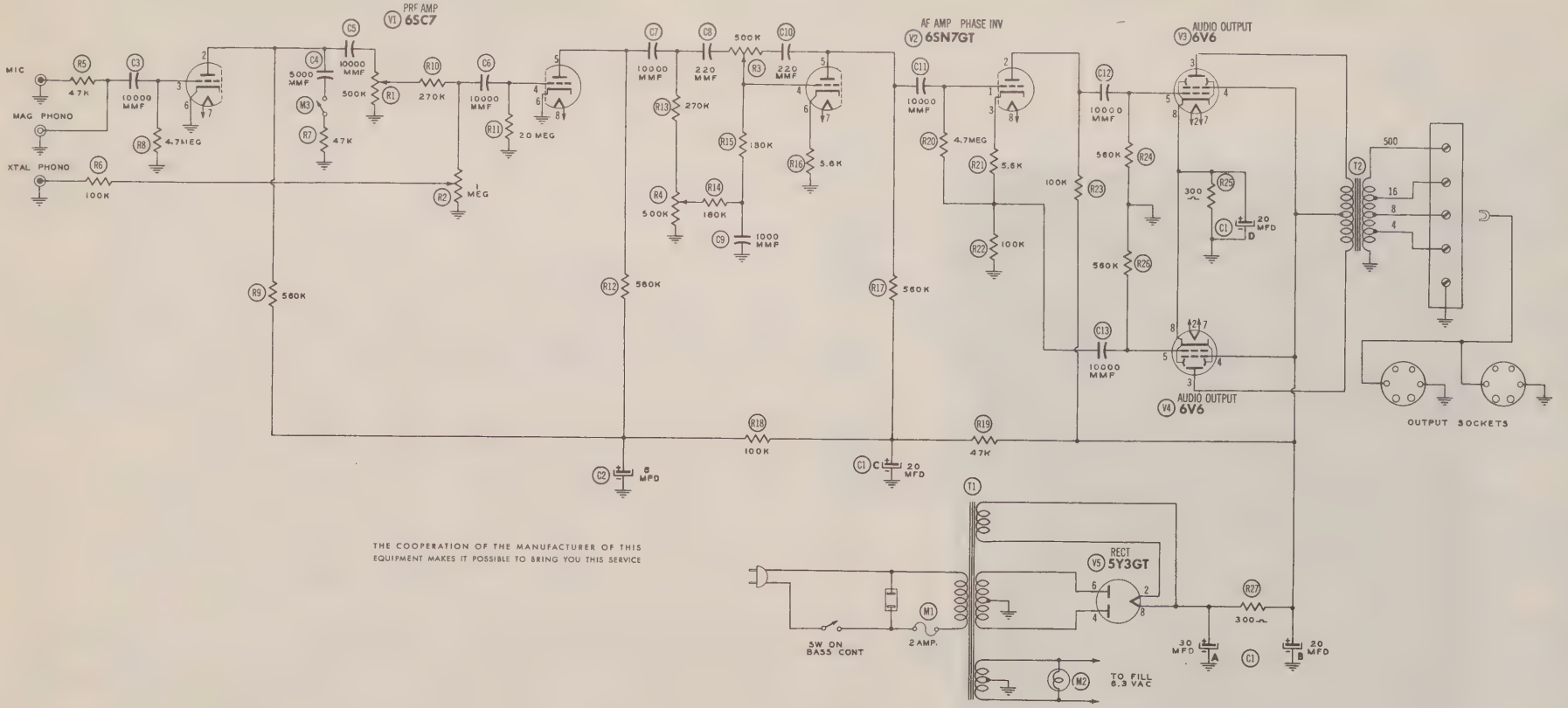
DON McGOHAN MODEL MG-10B



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†710KΩ	4.7Meg	20 Meg	†710KΩ	0Ω	.1Ω	.1Ω
V 2	6SN7GT	4.8Meg	†100KΩ	105KΩ	360KΩ	†610KΩ	5.6KΩ	.1Ω	.1Ω
V 3	6V6GT	INF	.1Ω	†514Ω	†300Ω	560KΩ	INF	.1Ω	300Ω
V 4	6V6GT	INF	.1Ω	†528Ω	†300Ω	560KΩ	INF	.1Ω	300Ω
V 5	5Y3GT	INF	200KΩ	INF	185Ω	INF	200Ω	INF	200KΩ

† MEASURED FROM PIN 2 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L. F. BL
3924 W
DENVER, C

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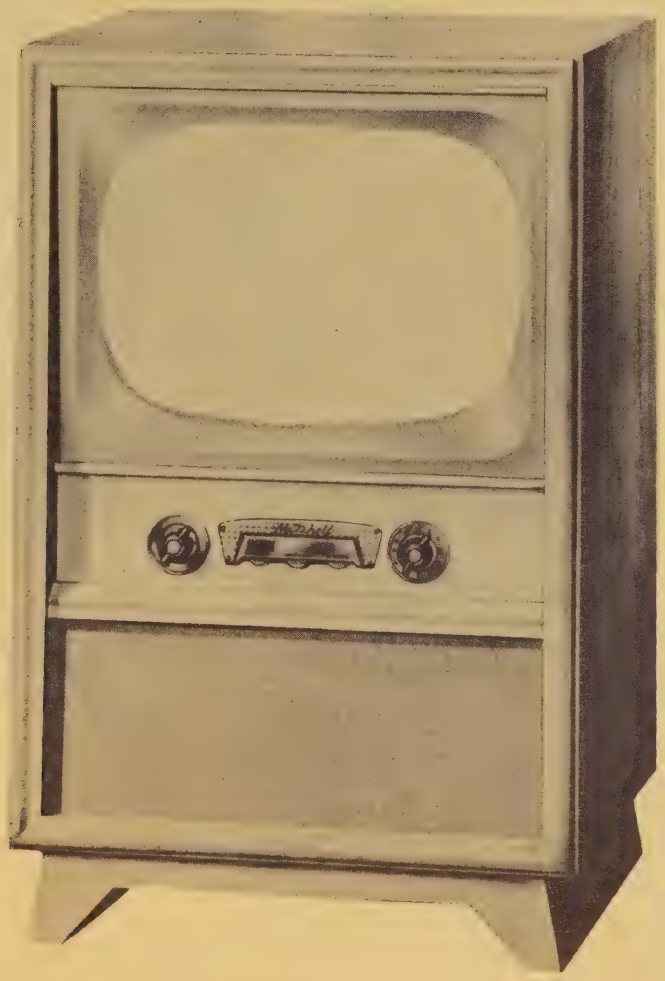

MODEL T212-B

MITCHELL
MODELS T212-B, -M

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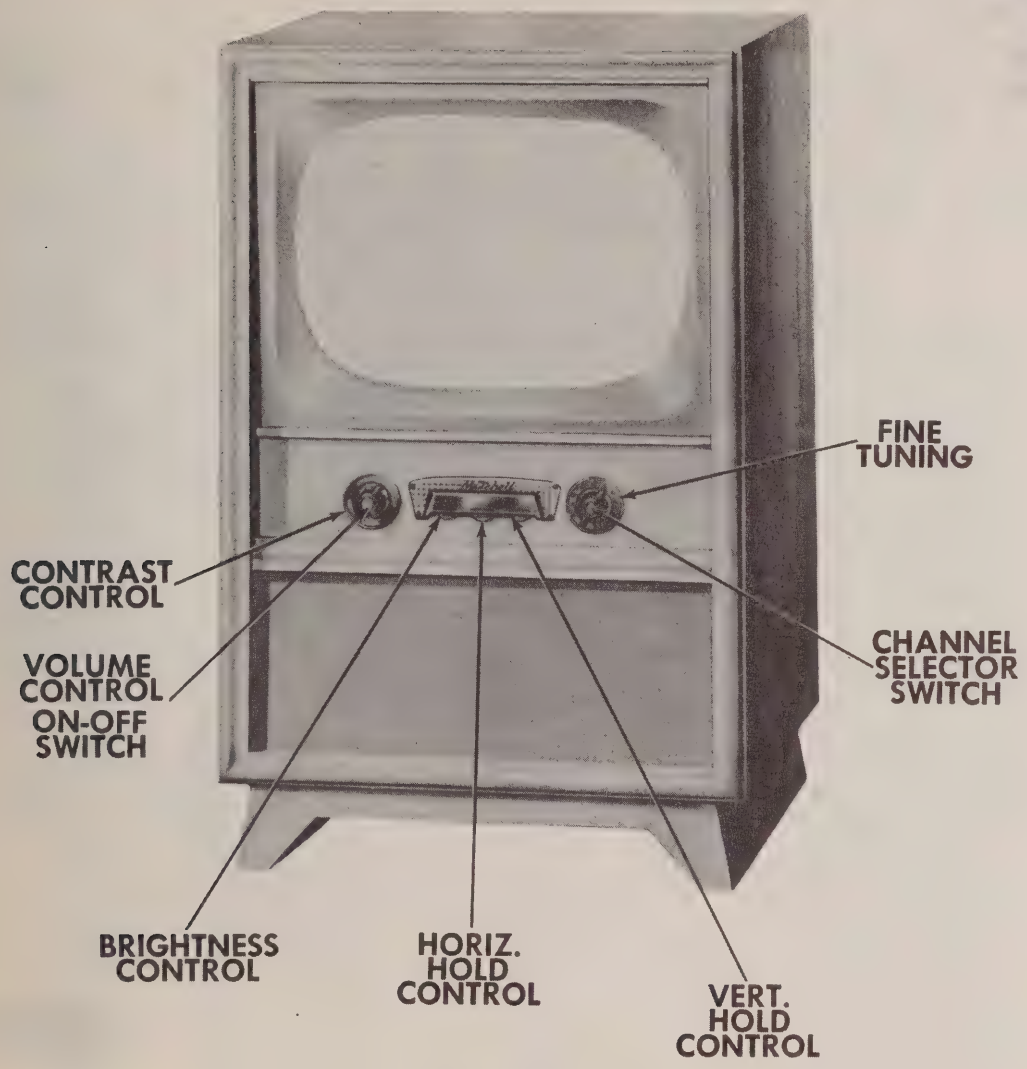

MITCHELL
MODELS T212-B, -M

MITCHELL MODEL T212-B

TRADE NAME	Mitchell Models T212-B, T212-M
MANUFACTURER	Mitchell Manufacturing Co,, 2525 Clybourn Ave., Chicago 14, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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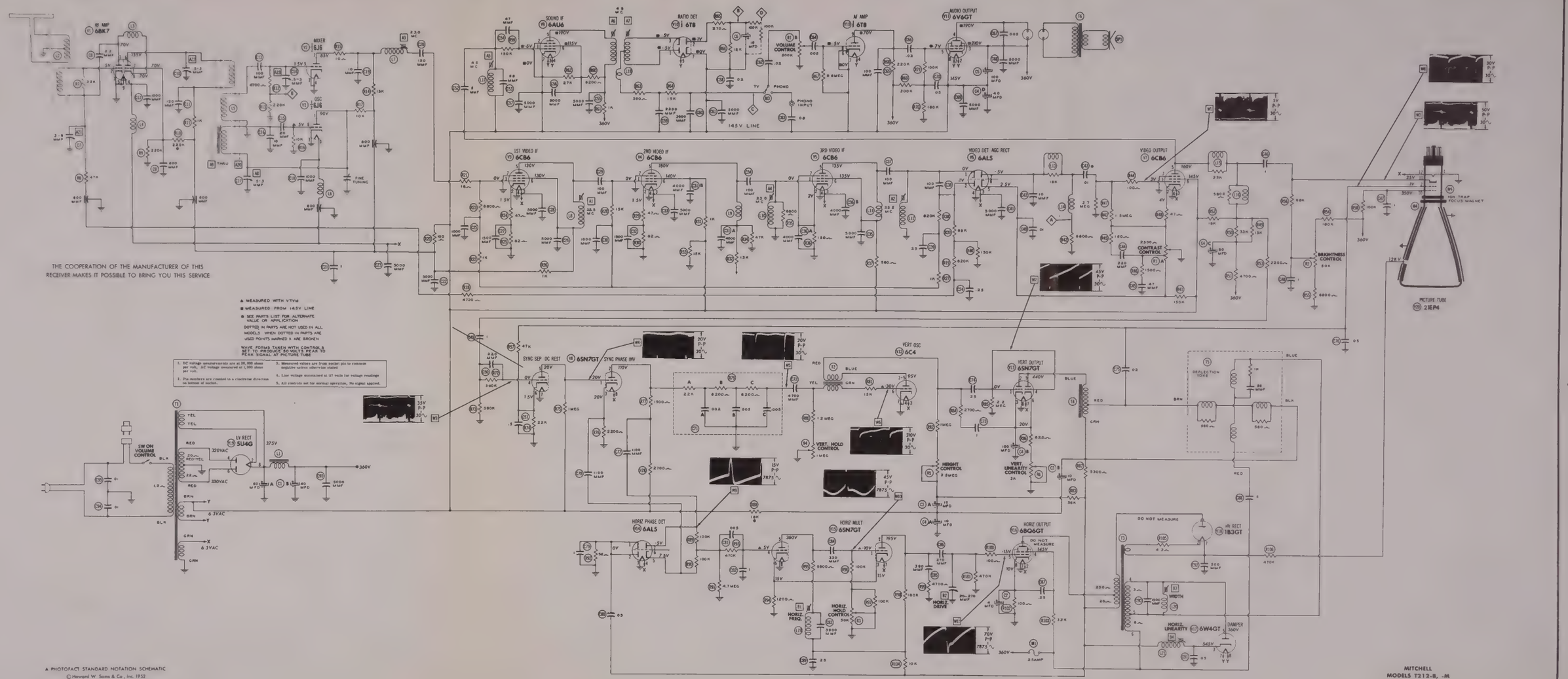
MITCHELL
MODELS T212-B, -M
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
■ MEASURED FROM 145V LINE
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line voltage disconnected at 117 volts for voltage readings
5. All controls set for normal operation, No signals applied.
SYNC SEP DC REST
SYNC PHASE INV
VERT OSC
VERT OUTPUT
HORIZ PHASE DET
HORIZ MULT
HORIZ OUTPUT
HV RECT
HORIZ LINEARITY
DAMPER
PICTURE TUBE
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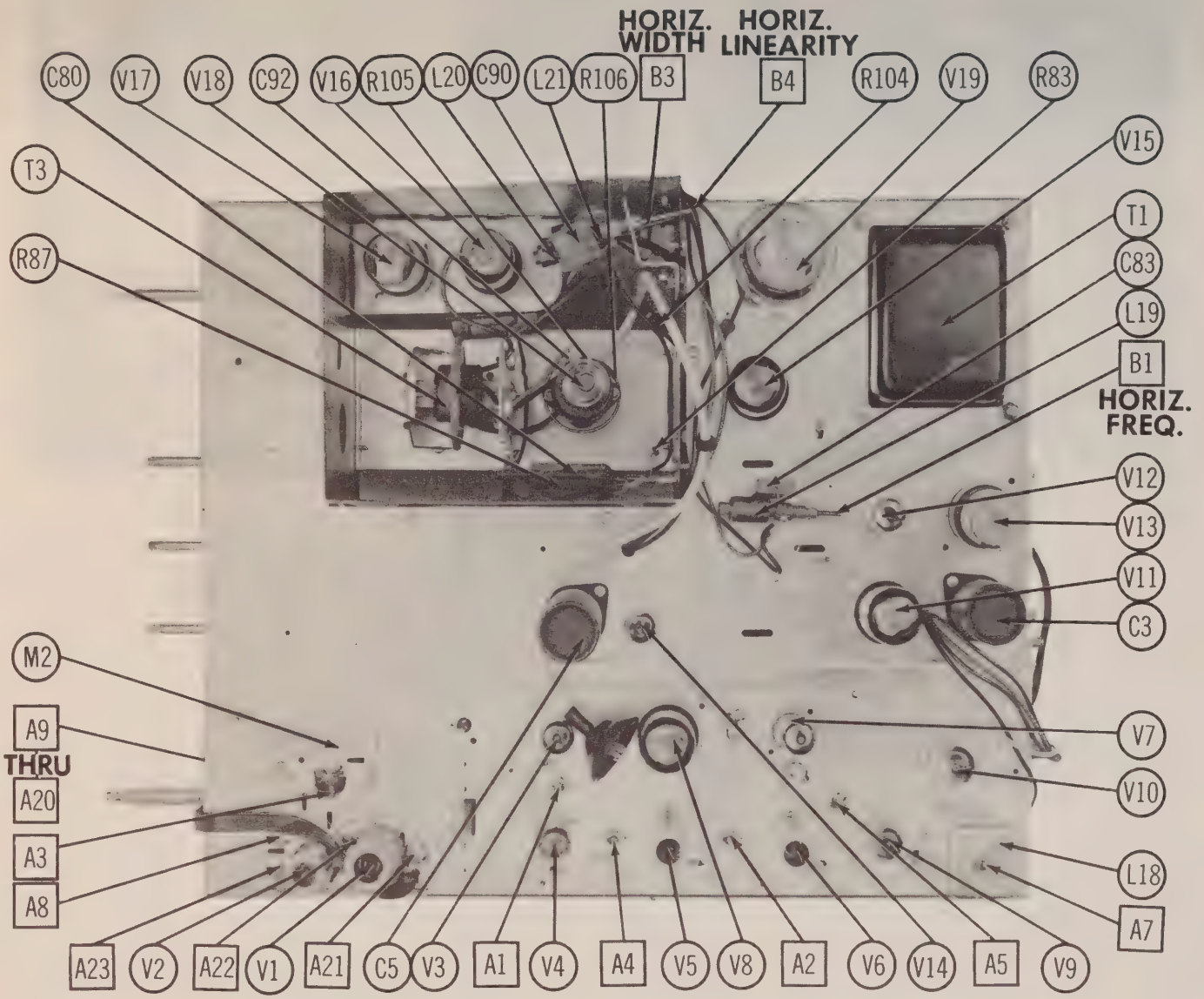
MODELS T212-B, -M



CHASSIS TOP VIEW

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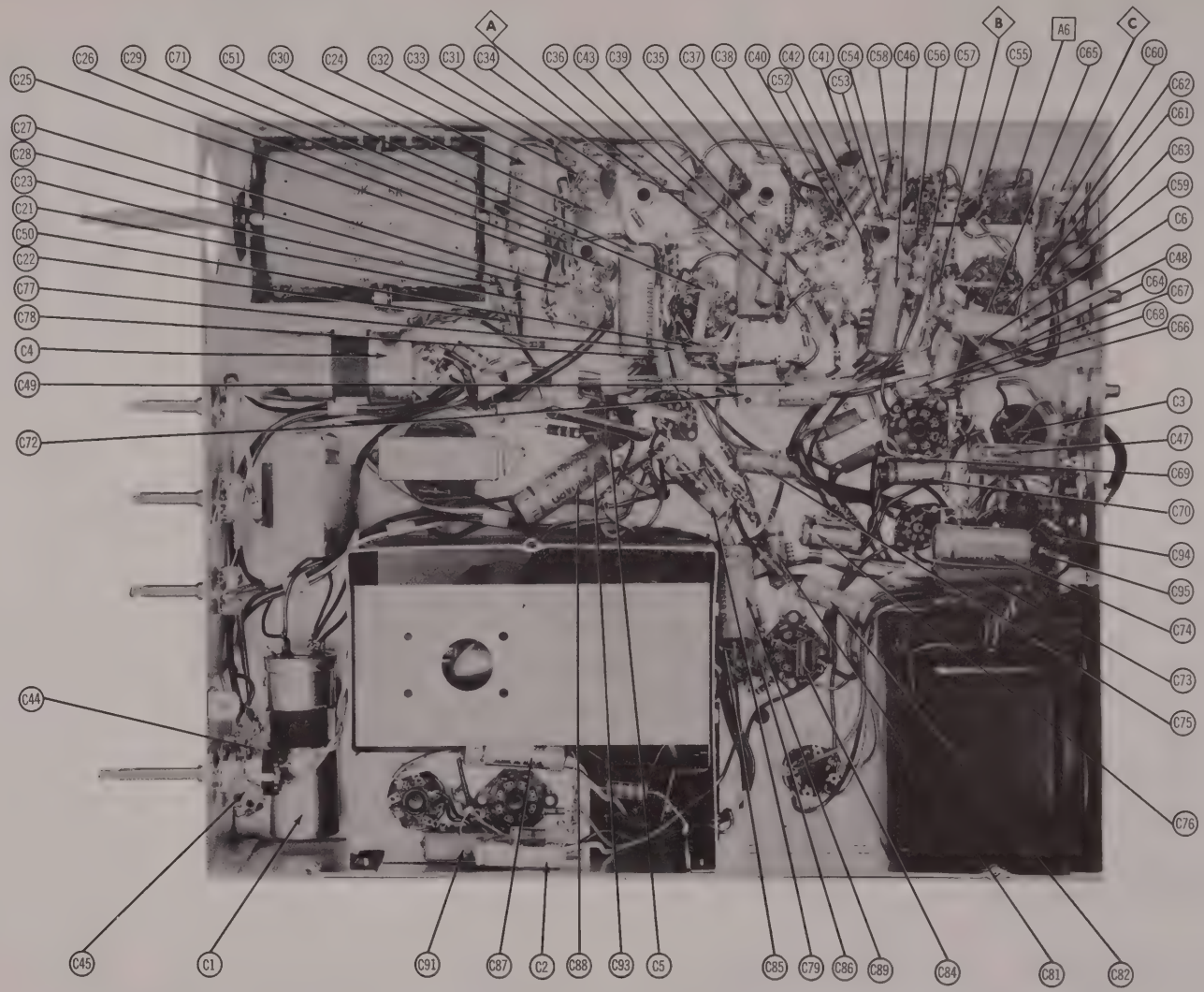

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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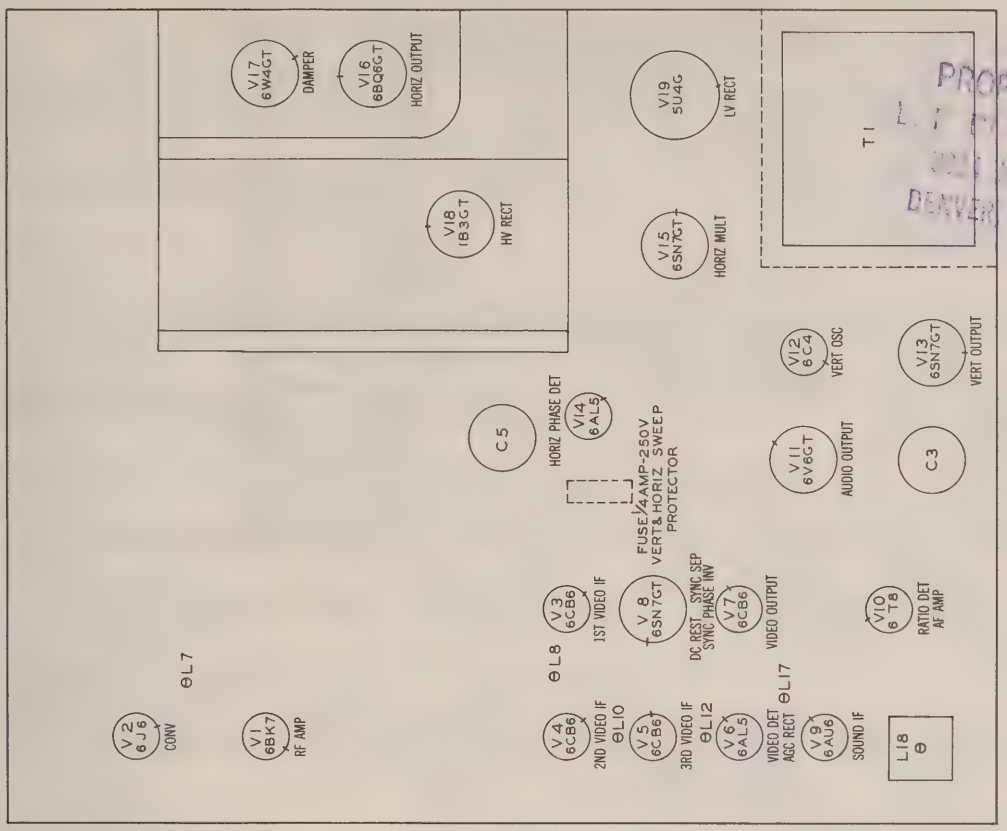
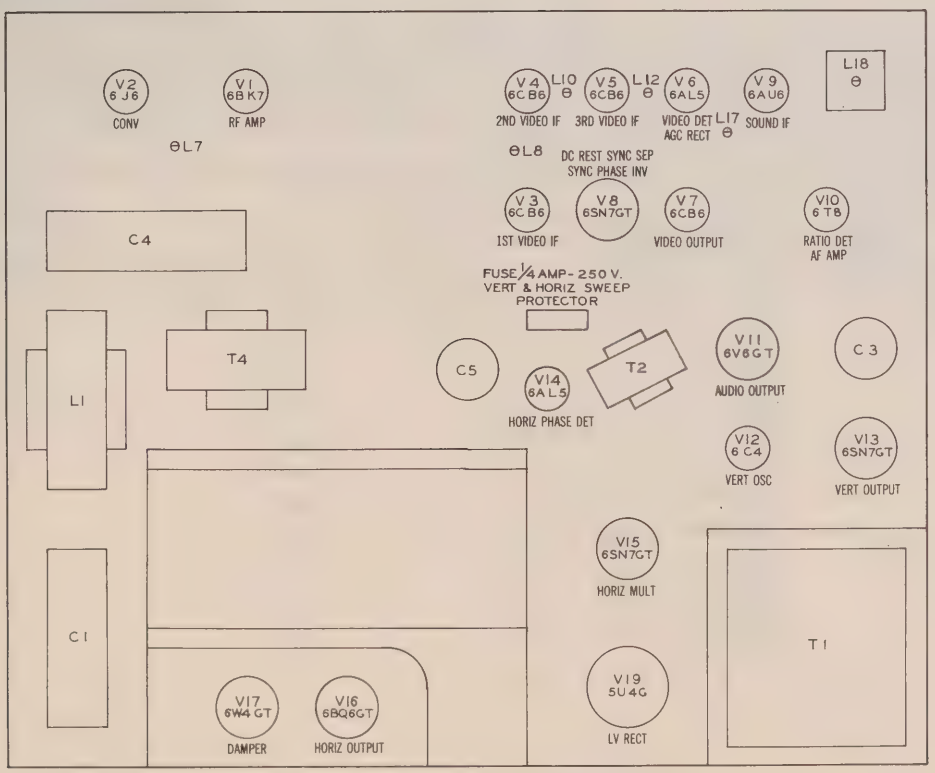


TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube, V15.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.5MC (unmod.)	Any	DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain approximately 1 Volt at point A.
2.	"	"	23.0MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	22.8MC 26.1MC	Any	Vert. amp. to point (A). Low side to chassis.		Check for response curve as per fig. 1. If necessary readjust A1 thru A4 for desired response

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control at maximum.
Connect two matched 100KΩ resistors across R66. The junction of these two 100KΩ resistors is alignment Point (D).
During this portion of the alignment avoid touching or grounding the case of the VTVM as it is approximately 140V potential above ground.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6CB6 (V7). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (B). Common to chassis.	A5, A6	Adjust for maximum deflection
5.	"	"	"	"	DC probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6CB6 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per fig. 2.
5.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A7	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A8. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A8 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC	13	Vert. amp. to Point (A). Low side to chassis.	A9	Adjust to place video marker at 60% on high frequency side of response curve as per fig. 4.
			207MC (10MC swp.)	205.25MC	12		A10	
			201MC (10MC swp.)	199.25MC	11		A11	
			195MC (10MC swp.)	193.25MC	10		A12	
			189MC (10MC swp.)	187.25MC	9		A13	
			183MC (10MC swp.)	181.25MC	8		A14	
			177MC (10MC swp.)	175.25MC	7		A15	
			85MC (10MC swp.)	83.25MC	6		A16	
			79MC (10MC swp.)	77.25MC	5		A17	
			69MC (10MC swp.)	67.25MC	4		A18	
			63MC (10MC swp.)	61.25MC	3		A19	
			57MC (10MC swp.)	55.25MC	2		A20	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A21, A22, A23	Adjust for maximum symmetrical response curve with markers at 90% as per fig. 5.
8.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check all channels for proper response as per fig. 5. If necessary for any channel, re-adjust A21, A22 and A23, then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

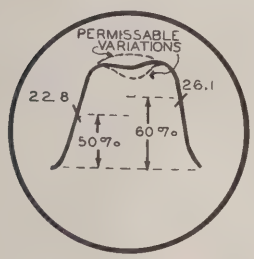


FIG.1

FIG. 2

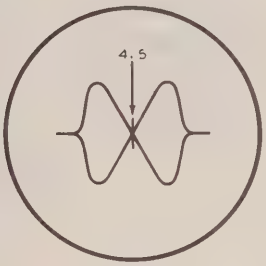


FIG. 3

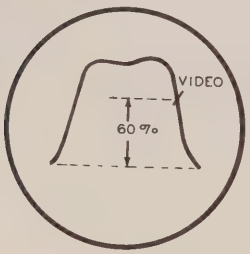


FIG.4

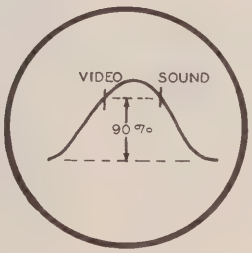
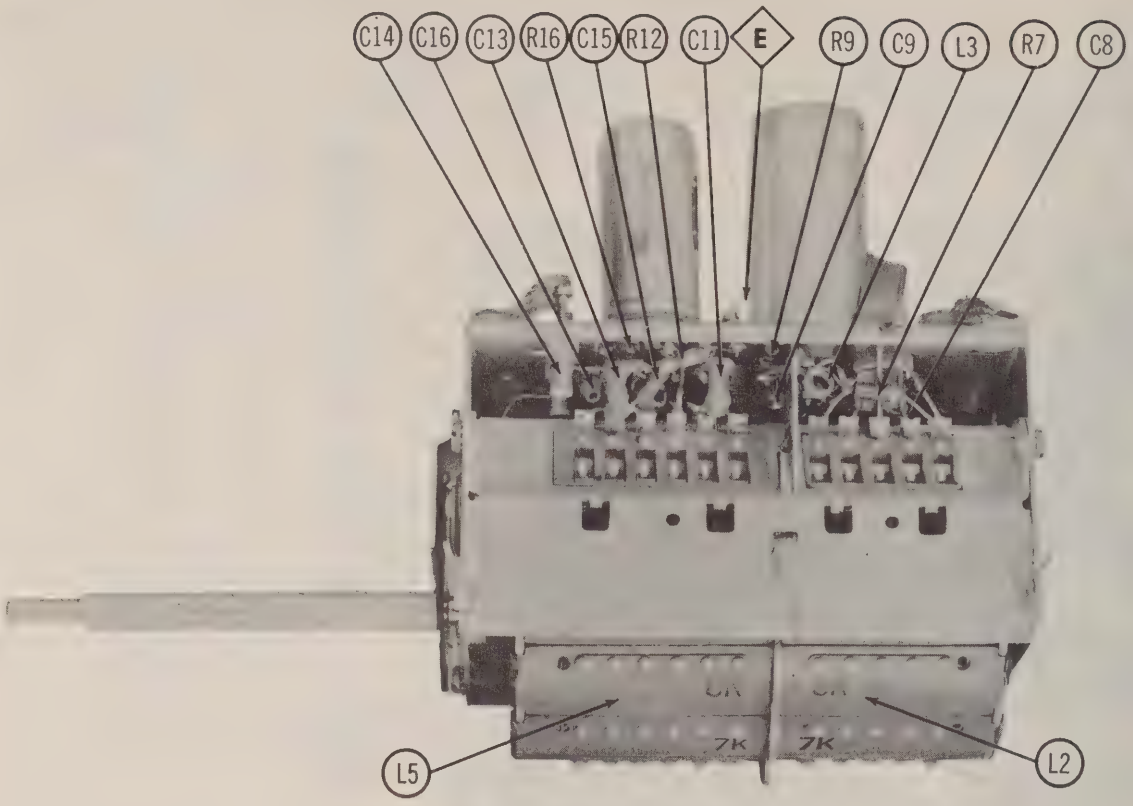


FIG.5

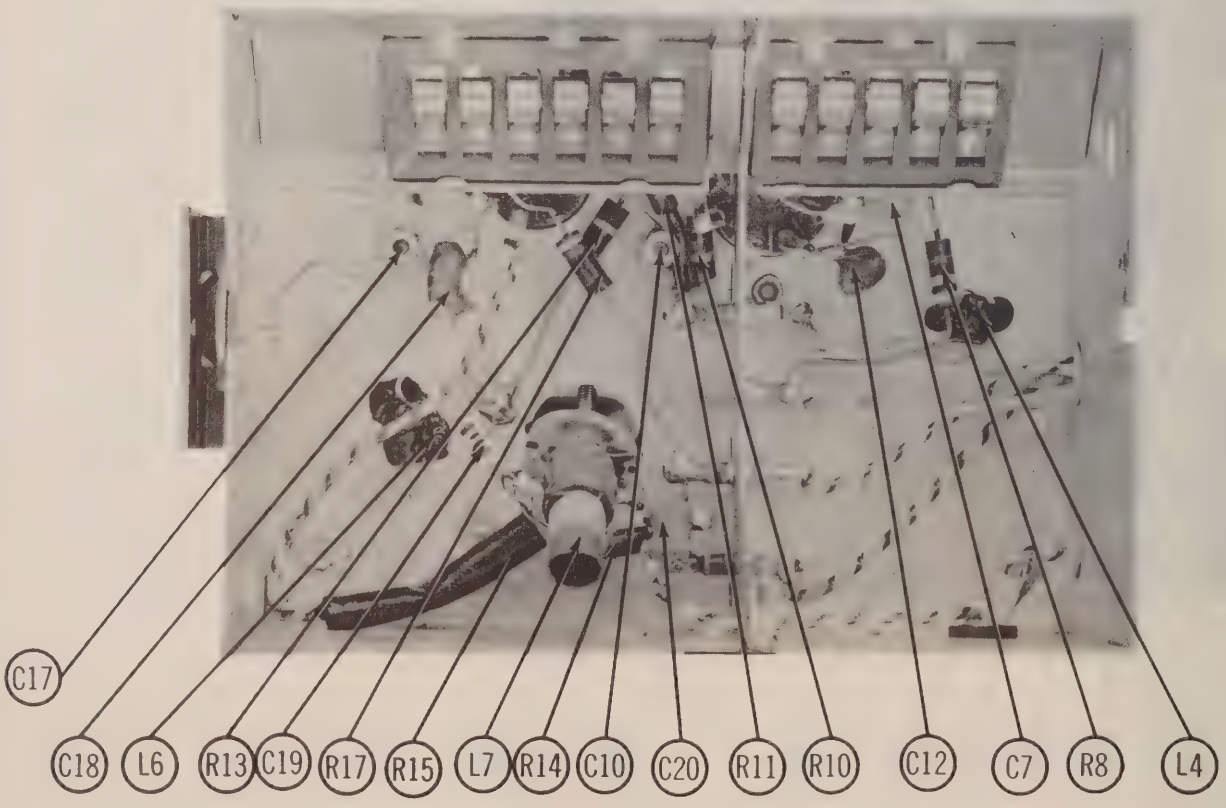
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	1Meg	0Ω	.2Ω	0Ω	■1.1KΩ	110KΩ	INF	0Ω
V 2	6J6	■10KΩ	■15KΩ	.2Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	130Ω	.1Ω	0Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 4	6CB6	1Meg	130Ω	.1Ω	0Ω	†10KΩ	■1KΩ	0Ω		
V 5	6CB6	.2Ω	150Ω	.1Ω	0Ω	■560Ω	■560Ω	150Ω		
V 6	6AL5	.2Ω	215KΩ	.1Ω	0Ω	2.2KΩ	INF	6.8KΩ		
V 7	6CB6	1Meg	300Ω	.1Ω	0Ω	■13KΩ	■0Ω	0Ω		
V 8	6SN7GT	■1Meg	■4.2KΩ	2.2KΩ	1.1Meg	■1Meg	22KΩ	0Ω	.1Ω	
V 9	6AU6	■150KΩ	■0Ω	■0Ω	■.1Ω	†1KΩ	†9.2KΩ	■0Ω		
V 10	6T8	INF	■12KΩ	INF	■.1Ω	■0Ω	■0Ω	■0Ω	■6.8Meg	†220KΩ
V 11	6V6GT	INF	■.1Ω	†460Ω	†65Ω	230KΩ	130KΩ	■0Ω	10KΩ	
V 12	6C4	#3Meg	INF	.1Ω	0Ω	#3Meg	1.9Meg	0Ω		
V 13	6SN7GT	2.2Meg	#6.6KΩ	1.2KΩ	2.2Meg	#6.6KΩ	1.2KΩ	.1Ω	0Ω	
V 14	6AL5	56Ω	56Ω	0Ω	.1Ω	4.8Meg	INF	4.8Meg		
V 15	6SN7GT	110KΩ	#190KΩ	1.2KΩ	5.1Meg	#16KΩ	1.2KΩ	.1Ω	0Ω	
V 16	6BQ6GT	INF	.1Ω	INF	†33KΩ	470KΩ	INF	0Ω	100Ω	TOP CAP #55Ω
V 17	6W4GT	INF	INF	5Meg	INF	†75Ω	INF	■.1Ω	■0Ω	
V 18	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								TOP CAP #305Ω
V 19	5U4G	INF	16KΩ	INF	20Ω	INF	22Ω	INF	16KΩ	
V 20	21EP4	0Ω	70KΩ	PIN 10 †100KΩ	PIN 11 90KΩ	PIN 12 .1Ω				

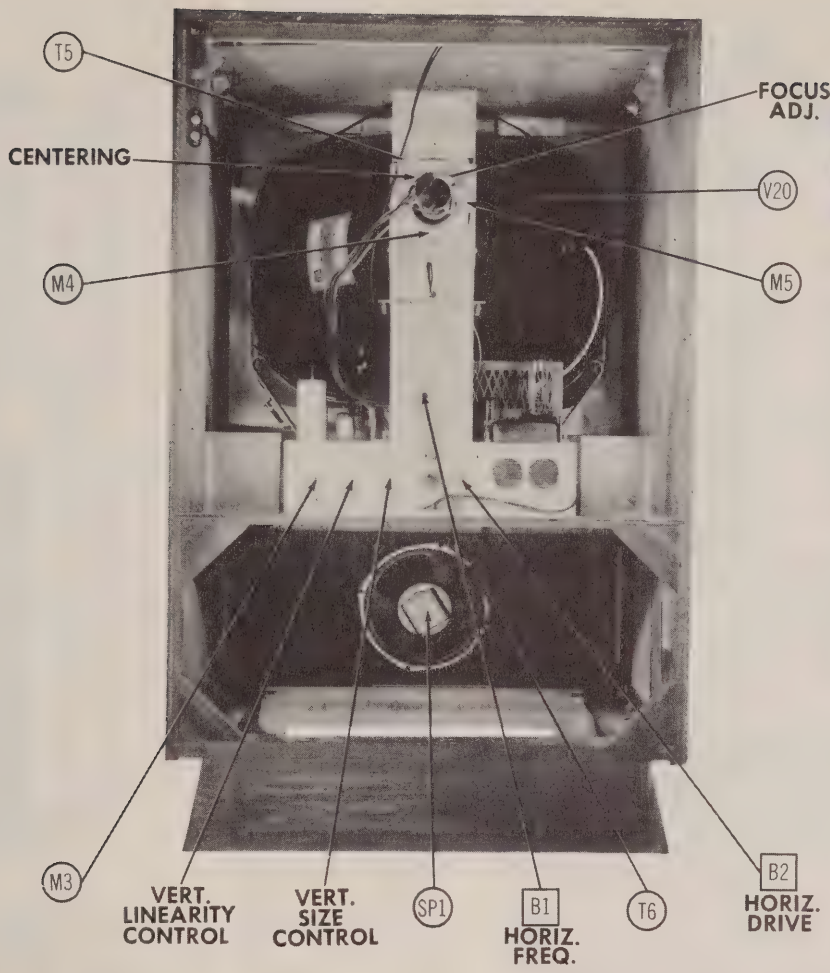
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
■ MEASURED FROM 145VDC LINE



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

If unable to maintain satisfactory horizontal sync by means of the horizontal hold control set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) to lock-in the picture.

The horizontal drive (B2), should be turned clockwise as far as possible without producing a bright vertical line in the picture.

The width slug (B3) should be adjusted for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front Panel.
2. Remove 9 wood screws and 1 metal screw. Remove rear Cover.
3. Disconnect Built in Antenna and Speaker.
4. Remove 2 wood screws and remove antenna bracket.
5. Remove 2 wood screws holding Speaker. Remove Speaker.
6. Remove 4 Chassis Bolts. Remove Chassis.

NOTE. For Picture Tube removal it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MITCHELL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BK7	6BK7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CH	
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Output	6CB6	6CB6	7CH	
V8	DC Restorer-Sync Separator-Sync Phase Inv.	6SN7GT	6SN7GT	6LD	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Vert. Oscillator	6C4	6C4	6BG	
V13	Vert. Output	6SN7GTA	6SN7GTA	8BD	
V14	Horiz. Phase Det.	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6G	6BQ6G	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MITCHELL PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RMA BASE TYPE	NOTES
V20	21EP4	21EP4	12D	① Circuit changes necessary
		21EP4A ①	12D	
		21FP4 ①	12C	
		21FP4A ①	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MITCHELL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	60	450	N-8038	AFH2-61		B054		FP240	TVL-2770	
B	40	450								
C2	4	50	N-8054	PR8150/4		BR550		TC30	TVA-1303	
C3A	10	450	N-8039	AFH2-47		B037		FP231	TVL-2750	
B	10	450								
C4A	10	450	N-8040	AFH4-120		D101		FP423.4	TVL-3761 TVA-1310	
B	100	50								
C	80	200								
D	40	200								
C5	100	250	N-8037						TVL-1578	
C6	16	50	N-8192	PR8150/16		BR1615		TC44	TVA-1409	
C7	3-9				829-10		NP0K-2R2		5TCCB-V22	
C8	2.2				TCZ-2.2					
C9	800			BPD-0008	D6-102	TM5T8	801-001	DC-521	5HK-D1	
C10	.5-3				829-3			C7565A		
C11	120			SI120	D6-121	TM5T12	GP1K-121	UC-5312	5GA-T12	
C12	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C13	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C14	.5-3				829-3			C7565A		
C15	30			SI20NP0	TCZ-20		NP0K-300	ZT-542		
C16	10			SI10NT50	TCN-10		N750K-100	NT-541	5TCU-Q1	
C17	.5-3				829-3			C7565A		
C18	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C19	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C20	120	500		SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C21	.1	200	N-1351	P288-1	DF-104	P32P1		PT401	2TM-P1	
C22	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	25	400	N-2579	P488-25		PTE40P25		PT4025	4TM-P25	
C25	1000		N-6887	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	1500		N-7371	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C28	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	100		N-6015	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C30	1000		N-6887	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31A	4000		N-7774	BPD-2X004	D6-402 D6-402	TM5SD4	832-004	DCD524	5HK-2D4	
B	4000				D6-402					
C32	1500		N-7371	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C33	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	100		N-6015	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C36A	4000		N-7774	BPD-2X004	D6-402 D6-402	TM5SD4	822-004	DCD524	5HK-2D4	
B	4000				D6-402					
C37	100		N-6015	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C38	100		N-6015	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C39	25	400	N-2579	P488-25		PTE4P25		PT4025	4TM-P25	
C40	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	PT4U1	4TM-S1	
C41	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	10	500	N-7843	1468-00001	D6-100	5W5Q	GP1K-100	MCB215	MS-41	
C43	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	Note 1
C44	220	500	N-8018	1468-00025	D6-221	5W5T35	GP2K-221	MC240	1FM-325	
C45	47	500	N-7836	1469-00005		5R5Q5		MCB225	MS-45	
C46	.1	400	N-1623	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C47	.1	400	N-1623	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C48	.1	200	N-1351	P288-1	DF-104	P32P1		PT401	2TM-P1	
C49	.1	400	N-1623	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C50	220	500	N-8106	1468-00025	D6-221	5R5T25	GP2K-221	UC-5322	5GA-T22	
C51	.5	200	N-8898	P288-5		P32P2		PT405	2TM-P5	
C52	5		N-7778	SI5	TCZ-4.7	5W5V5	GP1K-050	Z7-555	5GA-Q5	
C53	68		N-7844				N080-338-680			

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MITCHELL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	47	500	N-7836	1469-00005		5R5Q5		MCB225	MS-45	
C55	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C56	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C57	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C58	.02	400	N-1376	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C59	2200	500	N-6891	S12200	D6-222		GP2-333-222	UC-5235	5HK-D22	
C60	3900	500	N-6892	1467-004	D6-402	1D5D4	GP2-333-402	MC463	1FM-24	
C61	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C62	.02	400	N-1376	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C63	.02	200	N-8092							
C64	.005	800	N-4694	P888-005	D6-502	PTE8D5	GP2-333-502	PT825	8TM-D5	
C65	100		N-6015	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C66	.02	400	N-1376	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C67	.005	800	N-4694	P888-005	D6-502	PTE8D5	GP2-333-502	PT825	8TM-D5	
C68	.5000		N-6272	BPD-005	DD-504	TM5D5	811-005	DC-525	5HK-D5	
C69	5000		N-6272	BPD-005	DD-504	TM5D5	811-005	DC-525	5HK-D5	
C70	.05	200	N-1345	P288-05	DF-503	P32S5		PT412	2TM-S2	
C71A	.002			P688-002		PTE6D2	GP2-333-202	PT622		
B	.005		⊕ N-8042	P888-005	⊕ PC-100	PTE8D5	GP2-333-502	PT825	⊕101C1	
C	.005			P888-0005		PTE8D5	GP2-333-502	PT825		
C72	4700	500	N-6893	1464-005		1DR5D5		MCB465	MS-25	
C73	.1	400	N-1623	P488-1		PTE4P1		PT401	4TM-P1	
C74	.25	400	N-2579	P488-25		PTE4P25		PT4025	4TM-P25	
C75	.02	800	N-1376	P888-02	DF-203	PTE8S2		PT812	8TM-S2	
C76	.05	200	N-1345	P288-05	DF-503	P32S5		PT415	2TM-S5	
C77	100	500	N-7783							
C78	100	500	N-7783							
C79	200	100	N-1351	P288-1	DF-104	P32P1		PT401	2TM-P1	
C80	.05	800	N-8105	P1088-05		PTE10S5		PT1015	MB-85	
C81	.005	800	N-4694	P888-005	D6-502	PTE8D5	GP2-333-502	PT825	8TM-D5	
C82	.1	200	N-1351	P288-1	DF-104	P32P1		PT401	2TM-P1	
C83	3900	500	N-7373	1464-004		1DR5D4		MCB463	MS-24	
C84	330	500	N-7777	1469-00035						
C85	390	500	N-8890	1469-0004		5R5T4		MCB243	MS-34	
C86	270	500	N-8074	1469-0003	D6-271	5R5T3	GP2K-271	MCB241	MS-33	
C87	.25	400	N-2579	P488-25		PTE4P25		PT4025	4TM-P25	
C88	.5	200	N-8898	P288-5		P32P2		PT405	2TM-P5	
C89	.25	800	N-6895	884-25		PTE6P25		PT6025	6TM-P25	
C90	1500	500	N-8073	1464-0015		1R5D15		MCB456		
C91	.005	800	N-8105	P1088-05		PTE10S5		PT1015	MB-65	
C92	500	20000	N-8041	HV20C	TV3-502	MM-C20T5			20DK-T5	
C93	5000		N-6272	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C94	.01	800	N-6979	689ZGXY-01		P2S81		PT611	6TM-S1	
C95	.01	500	N-6979	689ZGXY-01		P2S81		PT611	6TM-S1	

Note 1. Some Models use .05MFD in this application (Part #N-1346)
Note 2. Items C71A, C71B, C71C, R79A, R79B, R79C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MITCHELL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	25000		N-8158	QJ-23 *	R-TV-342	BBBT-T07-S		Contrast-Tapped @ 5000Ω -Panel
B	500KΩ							Volume - Rear
R2A	50KΩ		N-8280	QJ1-123	AG-44-8	AN-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach To R3A
R3A	50KΩ		N-8280	QJ1-123	AG-44-8	AN-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R4A	1Meg		N-8279	QJ1-137	AG-81-8	AN-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach toR4A
R5A	2.5Meg		N-7341	QJ1-239	AG-84-8	AN-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3000Ω		N-8071	QJ1-113	AG-15-8	AN-10	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

** CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-11X & P1-200 (Panel)
B13-133 & R2-212 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MITCHELL PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ±10% UNLESS OTHERWISE NOTED
R7	22KΩ 20%				Antenna Coil Shunt
R8	47KΩ 20%				1st. RF Amp. Grid
R9	220KΩ 20%				2nd. RF Amp. Grid
R10	220KΩ 20%				Voltage Divider - See Note 1
R11	1000Ω 20%			BTS-1000	RF Amp. Dec.
R12	470Ω			BTS-4700	Mixer Grid
R13	220KΩ 20%				Mixer Grid
R14	15KΩ 20%				Mixer Plate
R15	10Ω 20%				Parasitic Suppressor
R16	10KΩ				Oscillator Grid
R17	10KΩ				Oscillator Plate
R18	4700Ω 20%		N-7000	BTS-4700	AGC Network
R19	820KΩ		N-2976	BTS-820K	AGC Network
R20	100Ω 20%		N-1349	BTS-100	Decoupling
R21	18Ω				Parasitic Suppressor
R22	1000Ω		N-1694	BTS-1000	AGC Network
R23	5800Ω		N-4630	BTS-5800	1st. Video IF Grid
R24	47Ω		N-6337		1st. Video IF Cathode
R25	82Ω		N-5857	BTS-82	1st. Video IF Cathode
R26	1000Ω		N-1694	BTS-1000	1st. Video IF Dec.
R27	1000Ω		N-1694	BTS-1000	AGC Network
R28	15KΩ		N-6424	BTS-15K	2nd. Video IF Grid
R29	47Ω		N-6237		2nd. Video IF Cathode
R30	82Ω		N-5857	BTS-82	2nd. Video IF Cathode
R31	1000Ω		N-1694	BTS-1000	2nd. Video IF Screen
R32	13KΩ	4	N-8036	1 3/4A-13K	2nd Video IF Plate Dec. - Wire Wound

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MITCHELL PART No.	IRC PART No.	IDENTIFICATION CODES
R33	15KΩ	3	N-3970	BTB-15K	Voltage Divider
R34	47KΩ	3	N-8083 *	BTB-47K	Voltage Divider
R35	6800Ω	1	N-4630	BTB-6800	3rd. Video IF Coil Shunt
R36	150Ω	1	N-3968	BTS-150	3rd. Video IF Cathode
R37	560Ω	1	N-4280	BTS-560	3rd. Video IF Dec.
R38	820KΩ	1	N-2976	BTS-820K	AGC Network
R39	68KΩ	1	N-4120	BTS-68K	AGC Network
R40	150KΩ	1	N-7003	BTS-150K	AGC Network
R41	150KΩ	1	N-7003	BTS-150K	Voltage Divider
R42	6800Ω	1	N-4630	BTS-6800	Video Det.Diode Load
R43	1.5Meg	1		BTS-1.5Meg	Bias Network
R44	100Ω 20%	1	N-1349		Parasitic Suppressor
R45	18Ω	1	N-4067	BTS-180	Contrast Control Shunt
R46	1500Ω 20%	1	N-7396	BTB-1500	Contrast Control Shunt
R47	2.7Meg	1		BTS-2.7Meg	Video Amp. Grid
R48	47Ω	1	N-6237		Video Amp. Cathode
R49	15KΩ	3	N-3970	BTB-15K	Video Amp. Plate
R50	33KΩ	1	N-8044	BTA-33K	Video Amp. Plate
R51	4700Ω	1	N-7154	BTA-4700	Video Amp. Plate Dec.
R52	18KΩ	2	N-8031	BTB-18K	Voltage Divider
R53	2200Ω	1	N-4896	BTS-2200	Isolation
R54	180KΩ	1		BTA-180K	Voltage Divider
R55	6800Ω	1	N-4630	BTS-6800	Voltage Divider
R56	68KΩ 20%	1	N-4120	BTS-68K	Picture Tube Cathode
R57	47KΩ	1		BTS-47K	Picture Tube Grid
R58	100KΩ 20%	1	N-2973	BTS-100K	Acc.Anode Load
R59	150KΩ	1	N-7003	BTS-150K	Sound IF Grid
R60	8200Ω	1	N-8034	BTA-8200	Sound IF Screen
R61	1000Ω	1	N-1694	BTS-1000	Sound IF Dec.
R62	27KΩ	1	N-7012	BTA-27K	Voltage Divider
R63	560Ω	1	N-4280	BTS-560	Balancing
R64	15KΩ	1	N-8424	BTS-15K	De-emphasis
R65	270Ω	1	N-4121	BTS-270	Balancing
R66	12KΩ	1	N-5690	BTS-12K	Ratio Det. Diode Load
R67	6.8Meg	1		BTS-6.8Meg	AF Amp. Grid
R68	220KΩ	1	N-8025	BTS-220K	AF Amp. Plate
R69	300KΩ 5%	1	N-8026		Voltage Divider
R70	180KΩ	1	N-4699	BTS-180K	Voltage Divider
R71	100KΩ	1	N-4458	BTS-100K	AF Output Grid
R72	560KΩ	1	N-7403	BTS-560K	Isolation
R73	560KΩ	1	N-7403	BTS-560K	Sync Sep. Grid
R74	22KΩ	1	N-8012	BTS-22K	Sync Sep. Cathode
R75	1Meg	1	N-4470	BTS-1Meg	Sync Sep. Plate
R76	2200Ω	1	N-4896	BTS-2200	Sync Phase Inverter Cathode
R77	1500Ω	1	N-7398	BTS-1500	Sync Phase Inverter Plate
R78	2700Ω	1		BTA-2700	Sync Phase Inverter Plate
R79A	22KΩ	1		BTS-22K	Int. Network
B	8200Ω	1	⊕ N-8042	BTS-8200	Int. Network
C	8200Ω	1		BTS-8200	Int. Network
R80	1.2Meg	1	N-4424	BTB-1.2Meg	Vert. Osc. Grid
R81	15KΩ	1	N-6424	BTS-15K	Vert. Osc. Grid
R82	1Meg	1	N-4470	BTS-1Meg	Vert. Osc. Plate Dec.
R83	56KΩ	1	N-6823	BTS-56K	Vert. Peaking
R84	2700Ω	1		BTA-2700	Vert. Output Grid
R85	2.2Meg	½	N-4061	BTB-2.2Meg	Vert. Output Cathode
R86	830Ω	1		BTA-830	Vert. Output Dec. - Wire Wound
R87	5300Ω	4	N-8287	1 3/4A-5000	Voltage Divider - See Note 2
R88	18KΩ 20%	1		BTB-18K	Horiz. AFC Diode Load
R89	100KΩ	1	N-2973	BTS-100K	Horiz. AFC Diode Load
R90	100KΩ	1	N-2973	BTS-100K	Horiz. AFC Diode Load
R91	4.7Meg 20%	1	N-6028	BTB-4.7Meg	Horiz. AFC Feedback
R92	56Ω	1	N-8155		Horiz. AFC Filter
R93	470KΩ	½	N-8029	BTS-470	Horiz. MV Cathode
R94	1200Ω	½	N-6723	BTS-1200	Horiz. MV Plate
R95	5800Ω	1	N-7406	BTA-5800	Horiz. MV Grid
R96	100KΩ 5%	1		BTS-100K - 5%	Horiz. MV Grid
R97	100KΩ	1	N-4458	BTS-100K	Horiz. MV Plate
R98	180KΩ	1	N-4699	BTS-180K	Horiz. Peaking
R99	4700Ω	1	N-7000	BTS-4700	Parasitic Suppressor
R100	100Ω 20%	½	N-1349		Horiz. Output Grid
R101	470KΩ	½	N-8029	BTS-470K	Horiz. Output Cathode
R102	100Ω	2	N-8030		Horiz. Output Screen
R103	33KΩ	2	N-8032	BTB-33K	Decoupling
R104	10KΩ	2	N-6239	BTB-10K	E.V. Sect. Filament
R105	4.3Ω	1	N-8126		H.V. Filter
R106	470KΩ	1			

Note 1. Some Models may use a 180KΩ Resistor in this application
Note 2. Some Models may use a 10KΩ Resistor in this application
* Items C71A, C71B, C71C, R79A, R79B & R79C are combined in one unit

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MITCHELL PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	8"	P.M.	3.2Ω	N-8055	ST-115 Mod. PV-8	8A21	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MITCHELL PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.
T1	117VAC @ 1.8A	660VCT @ .220 ADC	5VAC @ 3A	6.3VAC @ 6.3A SEC. 4 6.3VAC @ 2.5A	N-8069		P-3070		

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MITCHELL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	170Ω	16KΩ	N-7764	A-8125 ①	A-3000 ①	TB0-2	A-97X ①	Vert. Osc. Trans.
T3	270Ω tap ⓐ 20Ω	9Ω tap ⓐ 6Ω	N-8104	A-8130	HV0-7 ①		D-14 ②	Horiz. Output Trans.
T4	1300Ω tap ⓐ 12Ω		N-7717	A-8123	A-3037	TS0-8	A-102X	Vert. Output Trans.
T5A	9Ω		N-8057	DY-8	MDF-70		Y-12	Horiz. Deflection Coils
B	53Ω							Vert. Deflection Coils

① Drill one new mounting hole.
② Use with Width Coil WC-11.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MITCHELL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	5KΩ	3.2Ω	395Ω	.7Ω	Part of Spkr.	A-3877	A-2930	RO-9 ①	S-5X ①	① Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA MITCHELL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.220A	65Ω	2.3 Hy.	N-8064	C-2325 ①	C-2996 ①	TR-3300	C-21X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MITCHELL PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Coil	0Ω					
L3	RF Choke	0Ω					
L4	Fil. Choke	0Ω					
L5	RF, Mixer Grid & Osc. Coils	0Ω					
L6	Fil. Choke	0Ω					
L7	1st. Video IF	1Ω					
L8	2nd. Video IF	.2Ω		N-7745	TV-102		
L9	RF Choke	8.2Ω		N-7321		CL-1	10 Microhenries
L10	3rd. Video IF	.2Ω		N-7745	TV-103		
L11	RF Choke	8.2Ω		N-7321		CL-1	10 Microhenries
L12	4th. Video IF	.2Ω		N-7745	TV-102		
L13	Peaking Coil	10Ω		N-8060	*TV-184		174 Microhenries wound on 18KΩ resistor
L14	Peaking Coil	24Ω		N-8059			933 Microhenries
L15	Peaking Coil	10.6Ω		N-8061			217 Microhenries wound on 22KΩ resistor
L16	Peaking Coil	18.3Ω		N-8062			578 Microhenries wound on 5.6KΩ resistor
L17	Sound IF	1.2Ω		N-7746	TV-151		
L18	Ratio Det.	3.4Ω	.2Ω	N-7744			Tertiary Winding .2Ω
L19	Horiz. Osc.	70Ω		N-7748	TV-163		
L20	Width Coil	21Ω		N-8134			
L21	Horiz. Lin.	35Ω		N-8063	MWC-1		

*Parallel with 18KΩ resistor

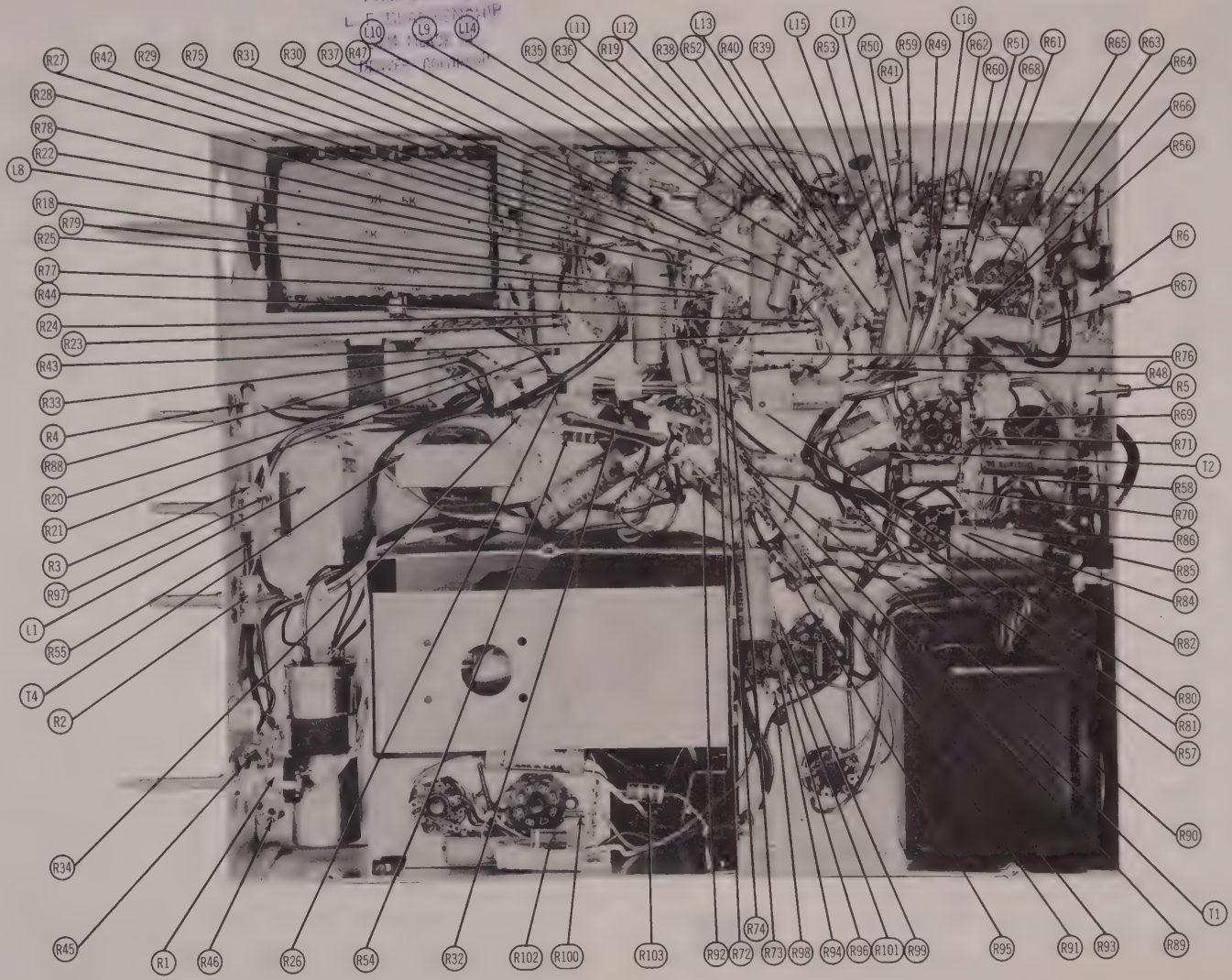
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MITCHELL PART No. FUSE	MITCHELL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG Pigtail	1/4A. 250V			318.250		GJV-1/4	

MISCELLANEOUS

ITEM No.	PART NAME	MITCHELL PART No.	NOTES
M2	RF Tuner		
M3	Switch	N-8099	
M4	Focus Magnet	N-8067	
M5	Ion Trap	N-8272	
B2	Trimmer	N-7375	20-270MMF Horiz. Drive

PROPERTY OF



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. T. PLANNER
3924 MEADE ST
DENVER, COLORADO

MOTOROLA
MODEL 52B1U (Ch. HS-305)

MOTOROLA
MODEL 52B1U (Ch. HS-305)

TRADE NAME	Motorola Model 52B1U (Ch. HS-305)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (FOUR)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3S4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC (or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 85 MA @ 67.5Volts DC
TUNING RANGE—BROADCAST	535-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001MFD	High side to stator plates of antenna section of tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	"	1620KC	"	"	A4	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A5	Install batteries in chassis. Adjust for maximum output.

To set pointer turn tuning gang fully closed and set last"5" in "55" to coincide with index mark on top of receiver case.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 52BIU(Ch. HS-305)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	23K611436	E73D19						Red
B	40	150								Blue
C	250	10								Orange
C2	470		21R115856	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C3	10000		21R115611	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C4	47		21R115593	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C5	1000		21R115611	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	.047	400	8R490232	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C7A	100			BPD-0001	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
B	2000		21K691992	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C	100			BPD-0001	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
D	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C8	10000		21R115611	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-51	
C9	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C10	.02	100	8R9817	P288-02	DF-203	PJ2S2		PT412	2TM-S2	
C11	.047	400	8K471635	489ZXP-05		PJ4S47		PT4147	4TM-S47	
C12	.05	400	24K611433	RC2		NF10170			72P51	Note 1

Note 1. Special 455KC resonate capacitor. Replace with same type unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	1/2	18A692018	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume-Note 1
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

Note 1. Add 47KΩ resistor in series with clockwise terminal & detector transformer.

RESISTORS

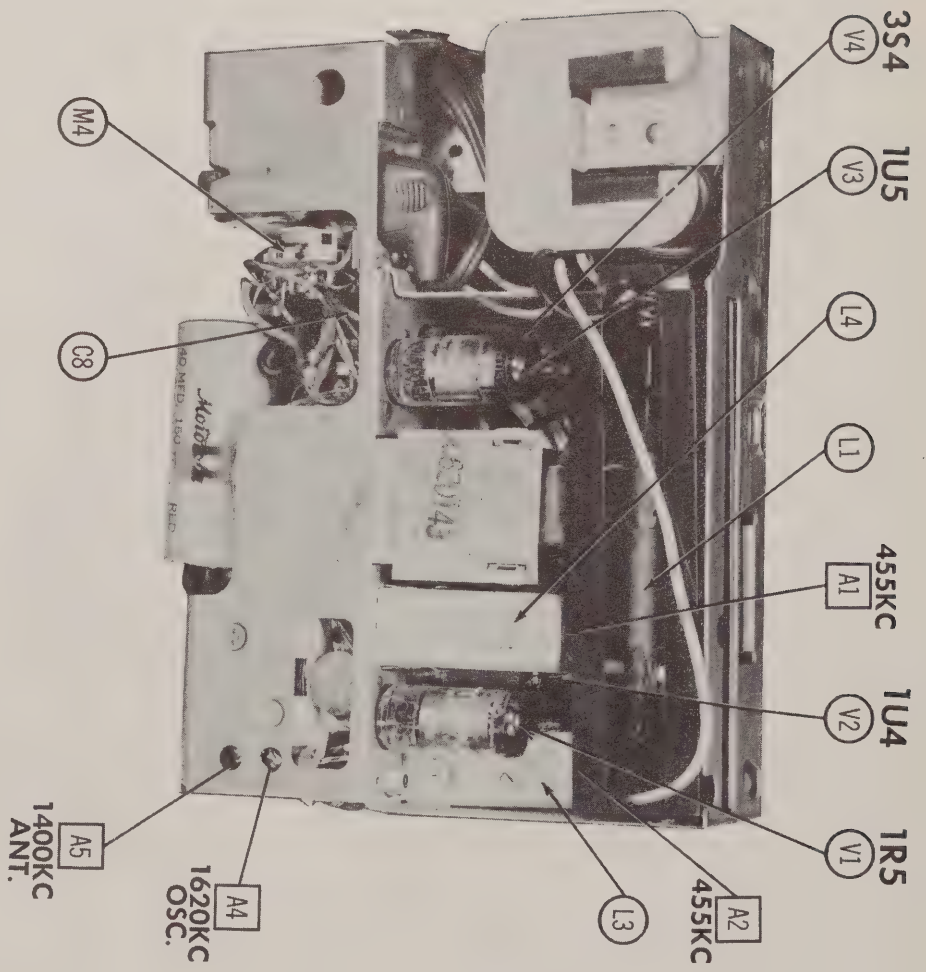
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	4.7Meg	1/2	6R2122	BTS-4.7Meg	
R3	100KΩ	1/2	6R6031	BTS-100K	
R4	15KΩ	1/2	6R6477	BTS-15K	
R5	10 Meg	1/2	6R2109	BTS-10 Meg	
R6	3.3Meg	1/2	6R2118	BTS-3.3Meg	
R7	10 Meg	1/2	6R2109	BTS-10 Meg	
R8	4.7Meg	1/2	6R2122	BTS-417Meg	
R9	1 Meg	1/2	6R6004	BTS-1 Meg	
R10	3.3Meg	1/2	6R2118	BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R11	27Ω	1/2	6R5683		
R12	390Ω	1/2	6R5554	BTS-390	
R13	270Ω	1/2	6R6432	BTS-270	
R14	680Ω	1/2	6R6040	BTS-680	
R15	220KΩ	1/2	6R6015	BTS-220K	
R16	820Ω	1/2	6R6269	BTS-820	
R17	2700Ω	1/2	6R5577	BTS-2700	
R18	150Ω	4	17A620037	1 3/4A-150	
R19	2000Ω	10	17K620038	1 3/4A-2000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	8.2KΩ	3Ω	385Ω	.45Ω	25B611377	A-3329 ①	A-2927①			① Bend mtg. tabs Mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	
SP1	$3\frac{1}{2}$"	PM	3Ω	50C620143	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	IRC PART No.	
L1	Loop Ant.	1.2Ω		24B611428			
L2	Osc. Coil	2.7Ω	11Ω	24B611429			
L3	Input IF	24Ω	24Ω	24K611438	BC-352		
L4	Output IF	35Ω	35Ω	24K611439	BC-353		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.058 A	48B791092	NA5	8J1	1002A	6S65	

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		950			2R			Two used in series.
M3	67.5V			457			K45		

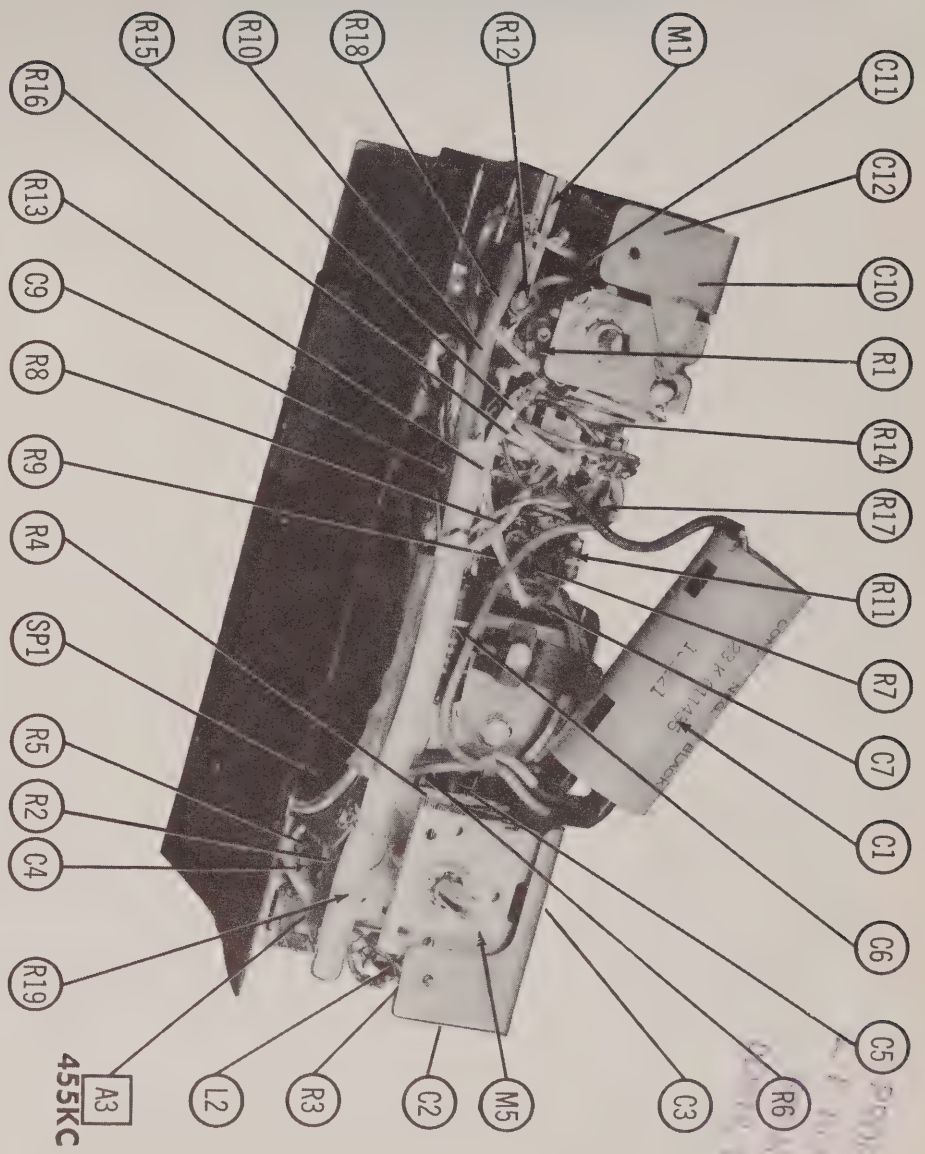
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B611426	Power Change-over (5PDT)
M5	Tuning Capacitor	19B611415	11-235MMF, 11-110MMF
	Knob	36C611430	Volume
	Knob	36K611431	Tuning
	Housing	1X620236	Lower: Plastic with locking fastener
	Housing	15D611323	Top: Less handle & studs
	Handle	55C611432	
	Stud	46A611497	For handle less spring

DISASSEMBLY INSTRUCTIONS

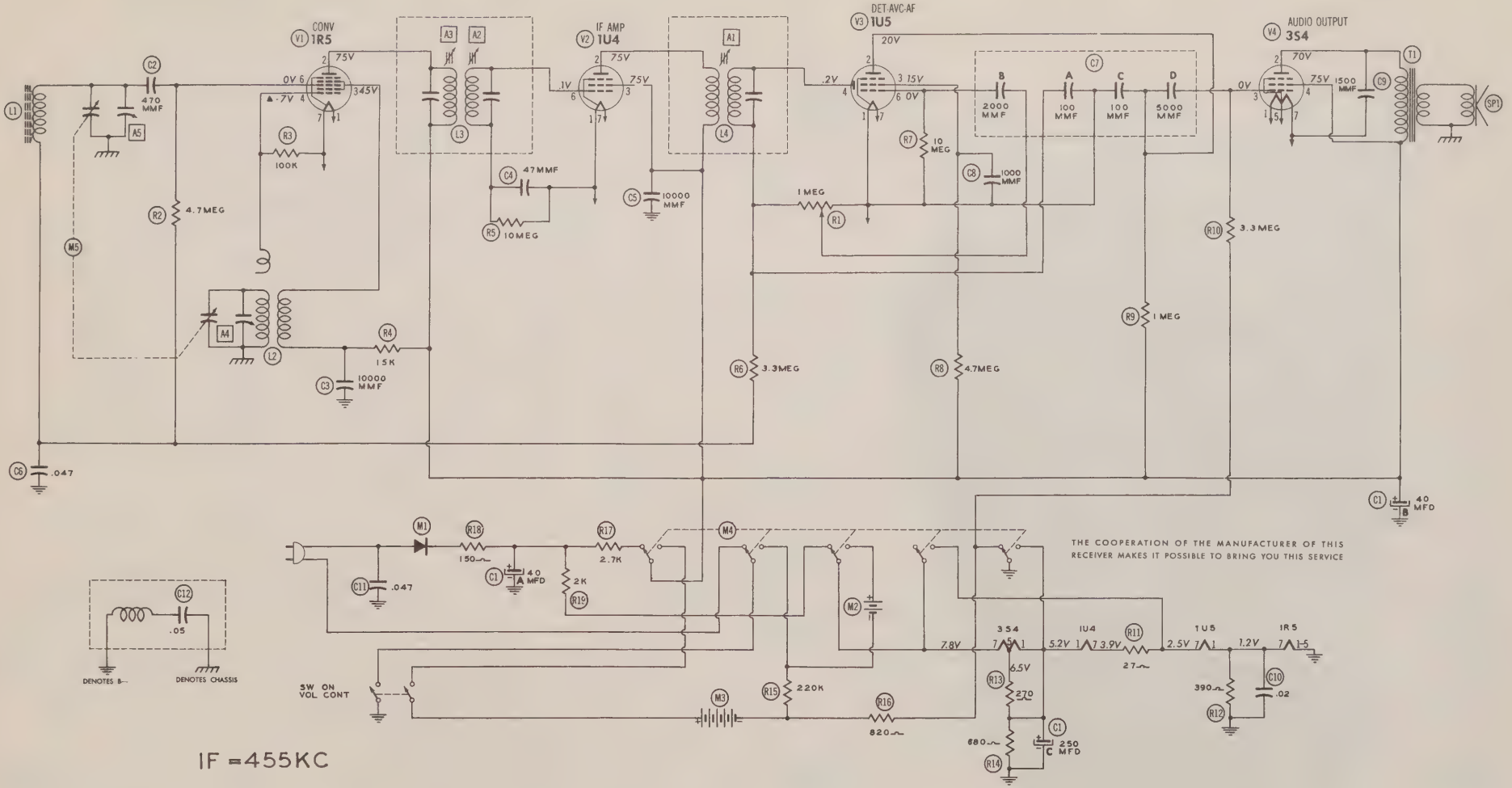
1. Remove 2 push on type control knobs from top of cabinet.
2. Remove 2 metal screws from top side of cabinet.
3. Spread sides of carrying handle. Lift up to remove top half of cabinet.
4. Loosen screw in bottom of lower half and lift chassis out.

CHASSIS—BOTTOM VIEW



SET 190 FOLDER 10

MOTOROLA
MODEL 52B1U (Ch. HS-305)



IF = 455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†2.8KΩ	†15KΩ	100KΩ	0Ω	9 Meg	*
V 2	1U4	*	†2.8KΩ	†2.8KΩ	4.3Meg	*	10 Meg	*
V 3	1U5	*	†1 Meg	†4.7Meg	1 Meg	*	10 Meg	*
V 4	3S5	*	†3.2KΩ	3.3KΩ	†2.8KΩ	*	†3.2KΩ	*

ALL MEASUREMENTS TAKEN WITH POWER CHANGE-OVER SWITCH IN AC-DC POSITION
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MOTOROLA MODELS 52L1, A,
52L2, A, 52L3, A (Ch. HS-327, HS-357)

PROPERTY OF
DENVER, COLORADO

MOTOROLA MODEL 52L1

TRADE NAME	Motorola Models 52L1, 52L2, 52L3 (Ch. HS-327), 52L1A, 52L2A, 52L3A (Ch. HS-357)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3S4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC (or) 3 volts "A" Supply & 67.5 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 9.5MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna. section of tuning gang Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1620 KC	"	"	A4	Attach chassis bottom cover Adjust for maximum output
3.		Loop	1400 KC	Tune to 1400 KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
	Note: Steps 4, 5 and 6 need not be performed unless receiver is off calibration or mistracks at low frequencies.						
4.		"	600 KC	Tune to 600 KC signal	"	A6	Rock tuner while adjusting for maximum output.
5.		"	1620 KC	Tuning gang fully open	"	A4	Readjust for maximum output if necessary.
6.		"	1400 KC	Tune to 1400 KC signal	"	A5	

To set pointer place chassis with speaker face down on table, rotate tuning gang fully closed and replace dial knob so that dot is at highest point of rotation.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	150	23B611270	E3C390						
B	▲40	150								
C	250	10								
C2	470		21R115856	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C3	10000		21R482726	BPD-01	DD-103	TM5S1	821- 01	DC-511	5HK-S1	
C4	10000		21R482726	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C5	10000		21R482726	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	.05	400	8R9861	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C7A	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
B	2000			BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C	100		21K691992	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
D	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C8	10000		21R482726	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C9	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C10	.1	100	8R9814	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C11	.05	400	8K471635	P488-05		PTE4S5		PT415	4TM-S5	
C12	.068	400	8R490234							

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	18K611379	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R2	4.7Meg	½	6R2122	BTS-4.7Meg	
R3	100KΩ	½	6R6031	BTS-100K	
R4	22KΩ	½	6R6397	BTS-22K	
R5	10Meg	½	6R2109	BTS-10Meg	
R6	3.3Meg	½	6R2118	BTS-3.3Meg	
R7	10Meg	½	6R2109	BTS-10Meg	
R8	4.7Meg	½	6R2122	BTS-4.7Meg	
R9	1Meg	½	6R6004	BTS-1Meg	
R10	3.3Meg	½	6R2118	BTS-3.3Meg	
R11	3300Ω	½	6R5581	BTS-3300	

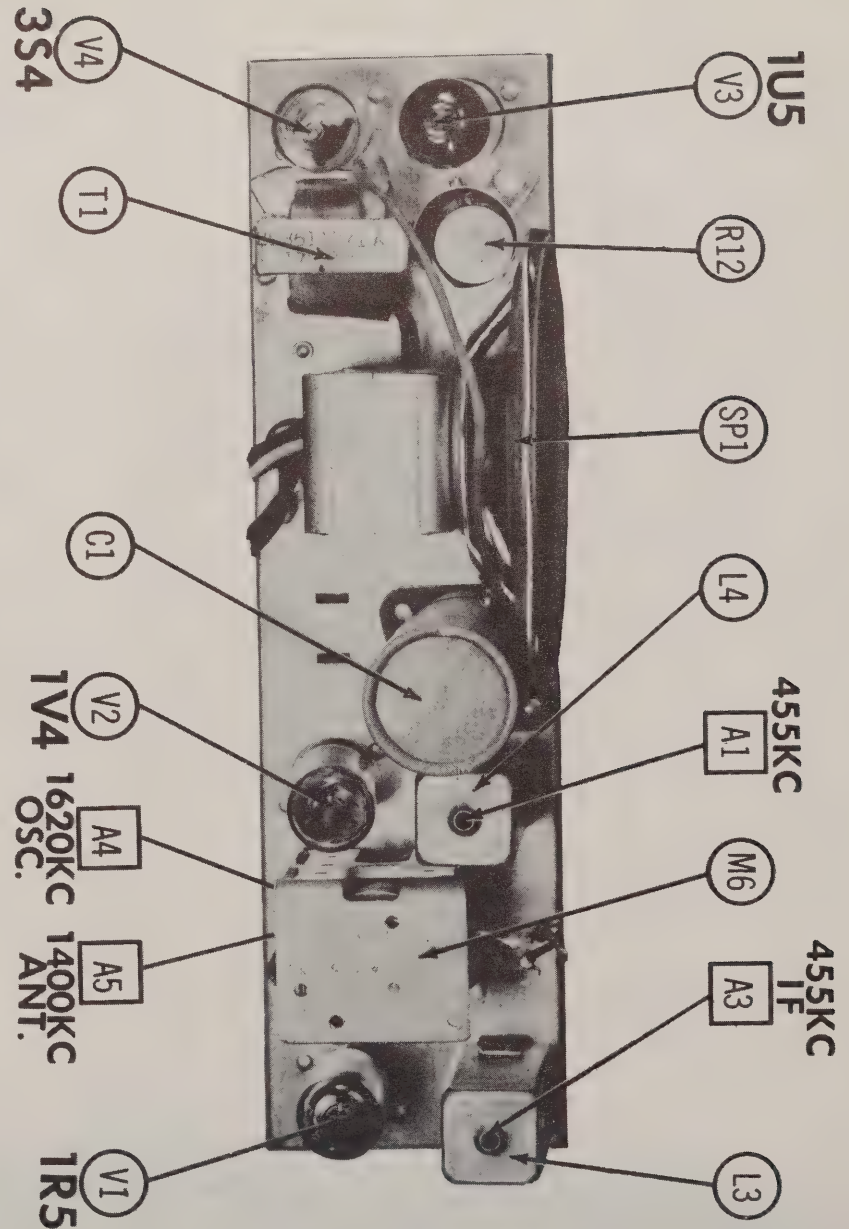
ITEM No.	RATING: OHMS	RATING: WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R12A	150Ω	10	17K611149		
B	2000Ω				
R13	220KΩ	½	6R6407	BTS-220K	
R14	680Ω	½	6R6040	BTS-680	
R15	270Ω	½	6R6432	BTS-270	
R16	680Ω	½	6R6040	BTS-680	
R17	27Ω	½	6R5683		
R18	390Ω	½	6R5554	BTS-390	
R19	820Ω	½	6R6269	BTS-820	Note

Note: Used only in Ch. HS-357.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	7KΩ	3.3Ω	356Ω	.43Ω	25B611271	A-3878 ①	A-2931 ①	RO-13 ①	S-7X ①	① Bend mounting tabs down, file out slots, mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	
SP1	3-1/2	PM	3.3Ω	50B620039	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	
L1	Loop Ant.	1.5Ω		24B611234		
L2	Osc. Coil	2.2Ω	9.5Ω	24B611273		
L3	Input IF	33Ω	33Ω	24K600824	BC-352	
L4	Output IF	42Ω	42Ω	24K620020	BC-353	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.059	48B791092	NB5	8J1	1002A	6S65	

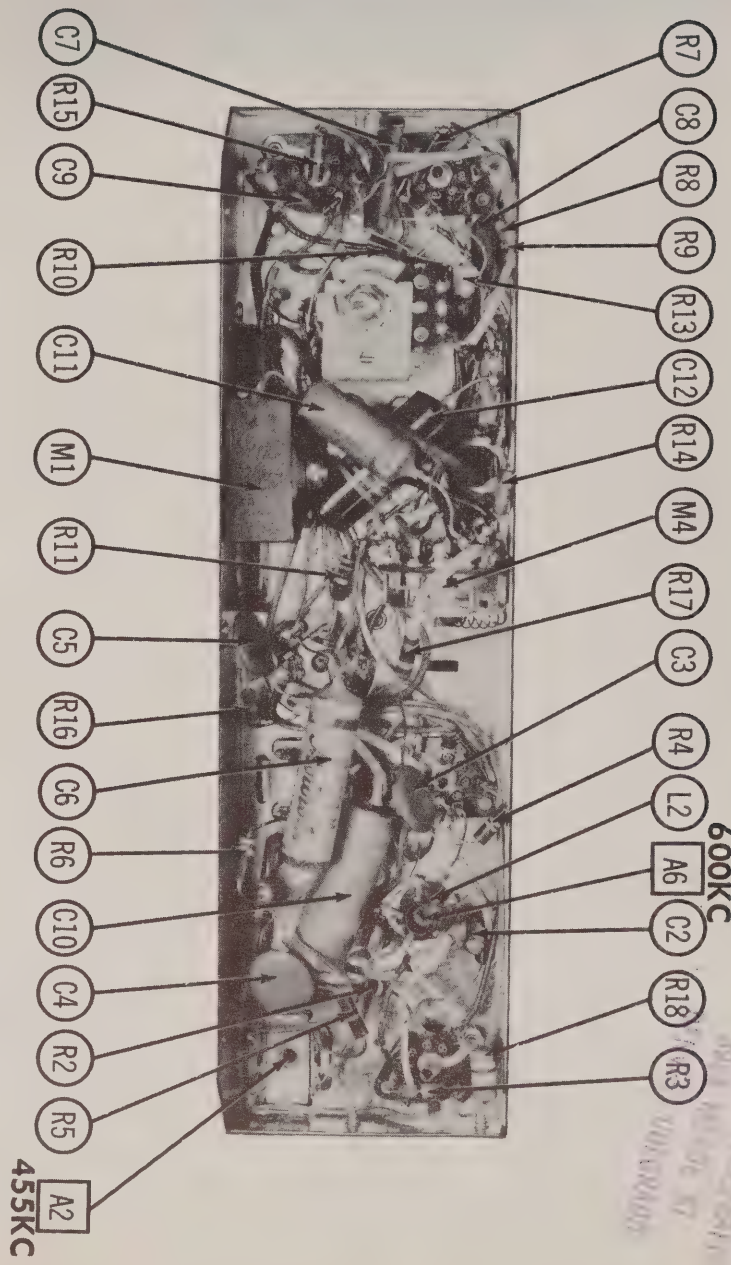
BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2 M3	1.5V 67.5V		964	477		21R	P45		2 used in series.

MISCELLANEOUS

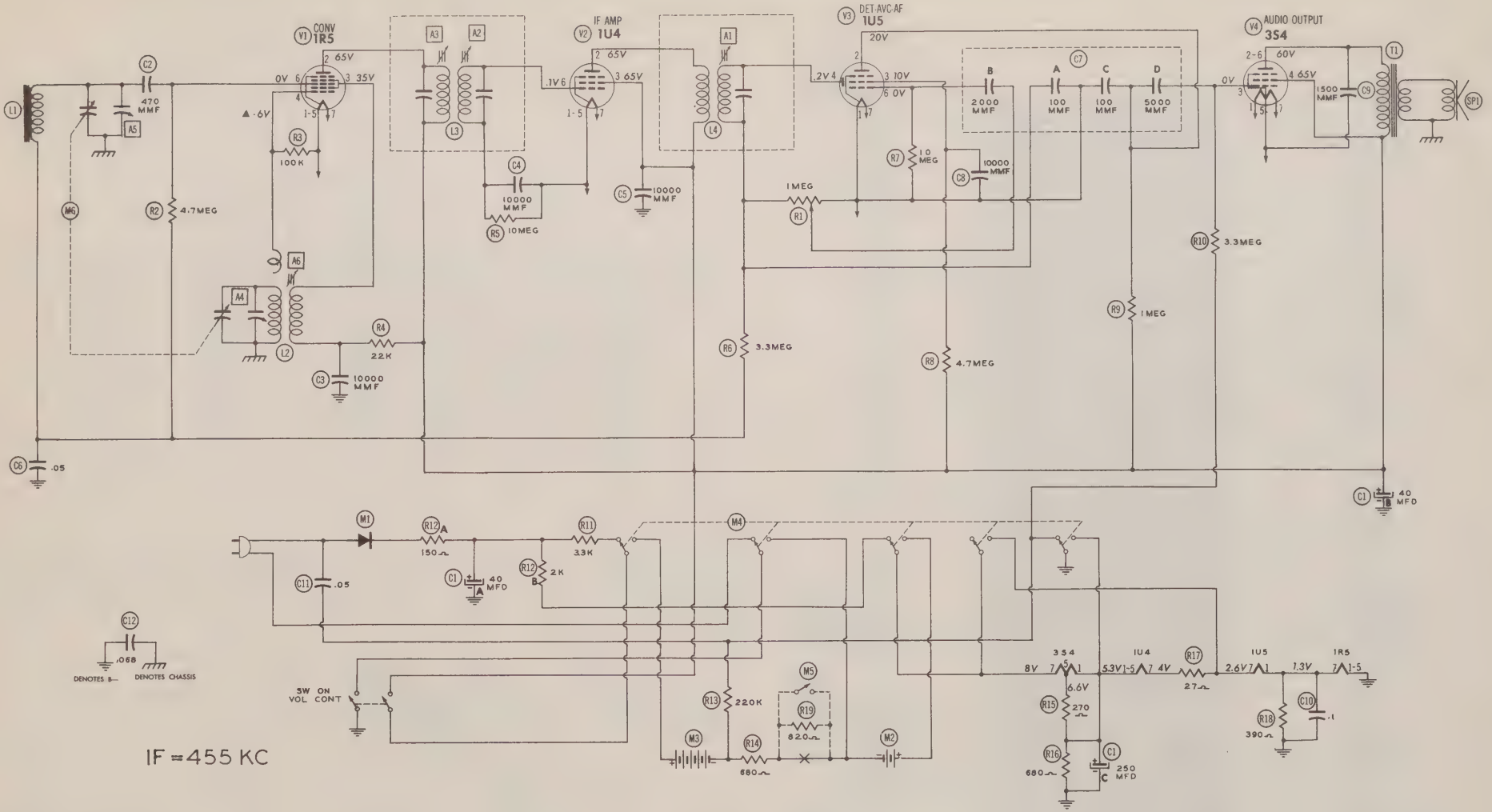
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B611284	Power Change-over (5PDT)
M5	Switch	40A690546	Battery Saver (Models 52L1A, 52L2A, 52L3A)
M6	Tuning Capacitor	19B611239	19-255MMF, 14-100MMF
	Knob	36K611228	Off/On Volume & Tuning (Green) Model 52L1, A, 52L3, A
	Knob	36K611229	Off/On Volume & Tuning (Maroon) Model 52L2, A
	Cabinet	1V620730	Complete with Grille & Back Cover (Green) Model 52L1
	Cabinet	1V620750	Complete with Grille & Back Cover (Maroon) Model 52L2
	Cabinet	1V620751	Complete with Grille & Back Cover (Gray) Model 52L3
	Cabinet	1V620898	Complete with Grille & Back Cover (Green) Model 52L1A
	Cabinet	1V620937	Complete with Grille & Back Cover (Maroon) Model 52L2A
	Cabinet	1V620939	Complete with Grille & Back Cover (Gray) Model 52L3A
	Escutcheon	13C611335	Knob - Top of Cabinet

CHASSIS—BOTTOM VIEW



MOTOROLA
MODEL 52L1 (Ch. HS-327)

MOTOROLA
MODEL 52L1 (Ch. HS-327)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†3.4KΩ	†25KΩ	100KΩ	*	9Meg	*
V 2	1U4	*	†3.4KΩ	†3.4KΩ	†25KΩ	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	0Ω	10Meg	*
V 4	3S4	*	†3.8KΩ	3.3Meg	†3.4KΩ	*	†3.8KΩ	*

ALL MEASUREMENTS TAKEN WITH POWER CHANGE-OVER SWITCH IN AC-DC POSITION.
† MEASURED FROM OUTPUT OF M1.
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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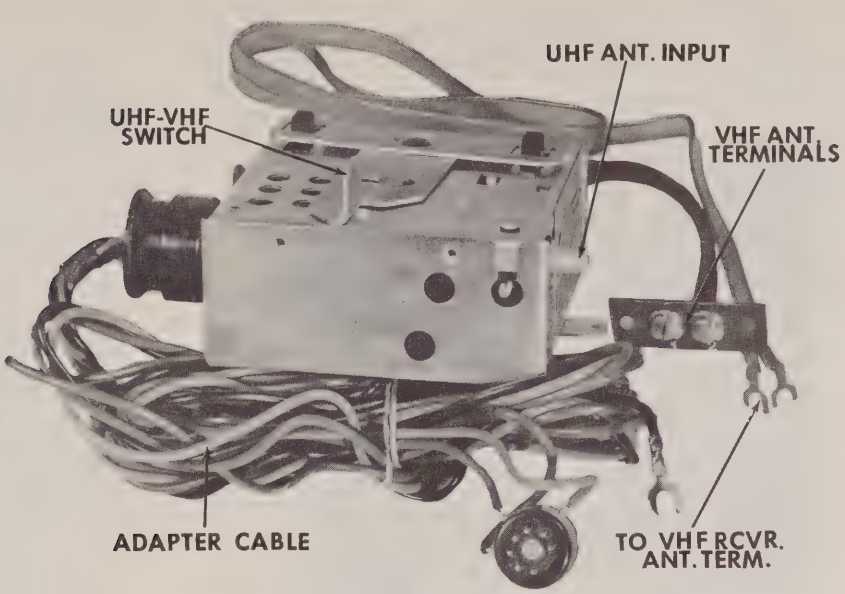
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RCA VICTOR MODELS U1A (Ch. KRK-19), U1B (Ch. KRK-19A)

PROPERTY OF

RCA VICTOR MODELS
U1A (Ch. KRK-19), U1B (Ch. KRK-19A)



TRADE NAME	RCA Victor Models U1A (Ch. KRK19), U1B (Ch. KRK19A)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	UHF Converter Designed to Operate on any one UHF Channel thru a VHF Receiver
TUBES (ONE)	Type 6AF4 RF Oscillator
POWER SUPPLY	10MA @ 70-370 Volts DC (See Installation Instructions) & 225MA @ 6.3 Volts AC
TUNING RANGE	470MC thru 890MC

INSTALLATION INSTRUCTIONS

GENERAL INFORMATION

UHF Converters Models U1A and U1B permit the reception of any one UHF television station within receiving range when employed with a VHF television receiver.

The unit employs one tube and a crystal rectifier. Filament and plate power is obtained from the receiver to which it is attached. The two models are identical except for power cables. The UHF Converter units may be mounted on the back of the receiver cabinet or other convenient location, as long as the converter switch is accessible.

USE ON RCA VICTOR MODELS

UHF Converter U1A is provided with a 52 inch power cable with a 7 pin miniature adapter socket for use with television receivers which employ a 6AQ5 audio output stage.

UHF Converter U1B is provided with a similiar power cable except that it employs an octal adapter socket for use with television receivers which use a 6K6GT or 6V6 audio output tube.

The chart on pages 5 and 6 lists all RCA Victor television receivers to date and the UHF Converter to be employed. Consult the chart and select the proper converter for the receiver.

Mount the UHF Converter on the back cover of the cabinet with the adjustment screw holes facing up. Be sure to locate the converter so that the converter switch may be reached conveniently from the top or side of the cabinet and so that the cables may be easily attached.

Mount the converter VHF antenna terminal board on the back of the cabinet.

To install the UHF Converter power cable, remove the television receiver audio output tube and plug the adapter socket into the receiver audio tube socket. In all television-radio combinations, except models 21T242 and 21T244, plug the adapter into the radio's audio output tube socket. Insert the audio output tube into the adapter socket. Ground the black lead with the spade terminal under the most convenient screw on the chassis. Dress the power cable out the back of the cabinet in the most convenient and orderly manner. With the end of the power cable hanging out the back of the cabinet fasten the receiver back cover in place making sure that the cable is not pinched under at any point. Connect the power cable to the converter.

Connect the UHF Converter output leads to the television receiver antenna terminals.

The UHF Converter is wired with a jumper across R5 as shown in the schematic diagram for receivers which provide 270 volts at the adapter socket. If the receiver provides 370 volts at the adapter socket, the jumper across R5 should be removed. See the chart on pages 5 and 6 for specific recommendations on RCA Victor receivers.

USE ON OTHER MAKES OF RECEIVERS

The U1A and U1B Converters will provide satisfactory UHF reception on other makes of receivers provided that the proper voltages for operation of the selector can be obtained from the receiver.

The U1A and U1B UHF Converters were designed for use on receivers in which the tube filaments are fed in parallel from a 6.3 volt transformer winding. Since the black lead of the converter power cable is connected to the converter chassis, the U1 series converters should not be employed with any receiver in which a direct connection exists between the a-c power line and the receiver d-c power supply.

The plate voltage available from the receiver may not be optimum for operation of the converter as wired. It is very important that between 60 and 90 volts should be present at the junction of R2 and R5 in order to obtain optimum crystal current. The voltage at the junction of R2 and R5 should be measured with the UHF Converter shield in place. To obtain proper voltage at R2 and R5, shunt R3, R4 and R5 as necessary with resistors of adequate wattage to obtain desired voltage.

The television receiver operating voltages should not be materially altered by the installation of UHF Converter.

In some makes of receivers it may be necessary to rewire the adapter socket and cable to suit the particular type of audio output tube. In some instances where filament wiring difficulties are encountered, it may be necessary to remove the adapter socket and wire the power cable into the television receiver.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		RCA VICTOR PART No.	STANDARD REPLACEMENT		
V1	RF Oscillator	6AF4	6AF4	7DK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	47		77278	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C2	47		77278	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C3	.5-3		77273		829-3			CT565A		
C4	3		77277	SI3NP0	TCZ-3		NP0K-030	ZT-553		
C5	22		76557		TCZ-22		NP0K-220		5TCC-Q22	

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	
R1	10KΩ	½	503310	BTS-10K	
R2	1000Ω	½	503210	BTS-1000	
R3	33KΩ	2	523333	BTB-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R4	33KΩ	2	523333	BTB-33K	
R5	8200Ω	2	523282	BTB-8200	

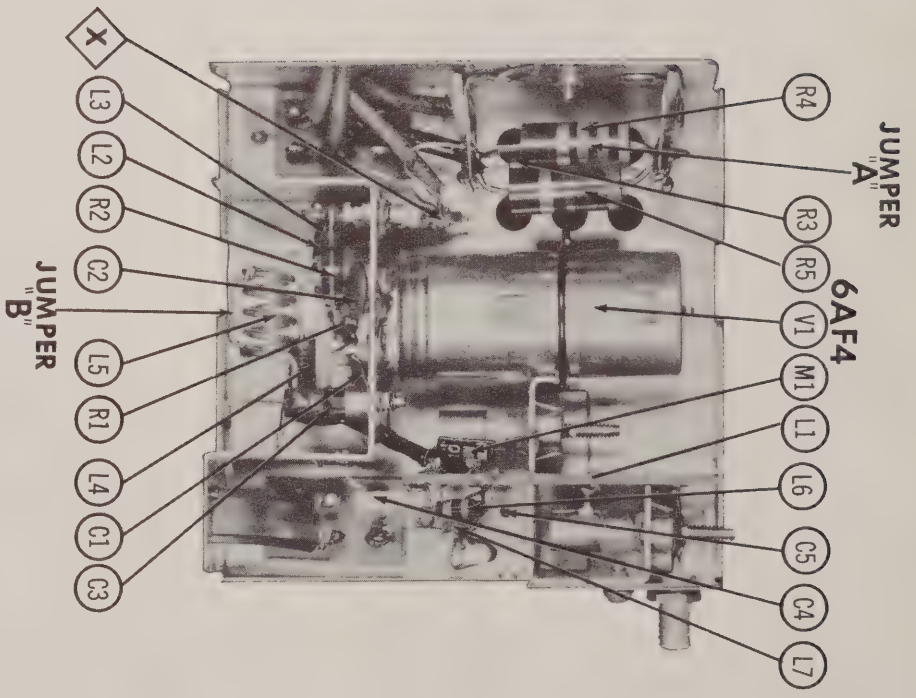
COILS (RF-IF)

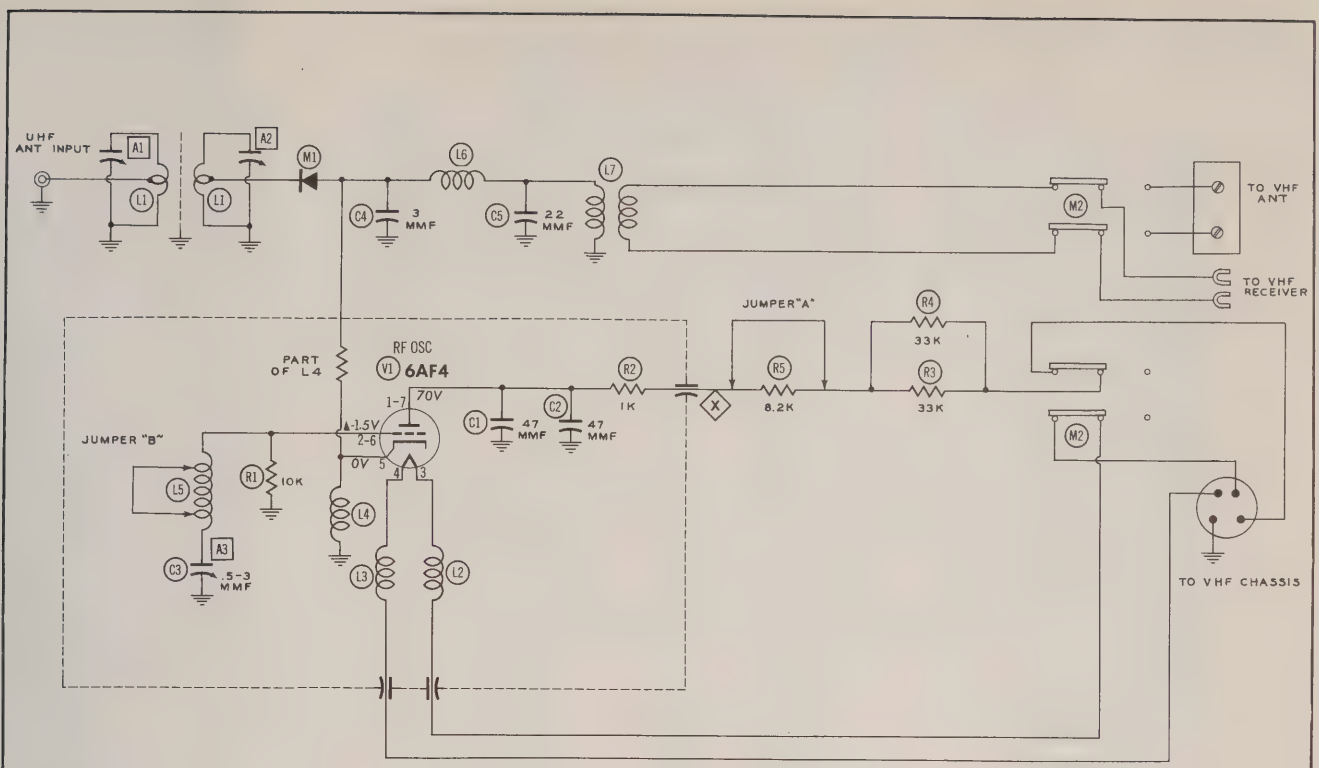
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA VICTOR PART No.	MERIT PART No.	
L1	UHF Ant. Trans.	0Ω	0Ω	77271		
L2	Fil. Choke	.1Ω		77279		
L3	Fil. Choke	.1Ω		77279		
L4	Cathode Choke	0Ω		77280		Wound on 1.8KΩ resistor
L5	Osc. Coil	0Ω		77281		
L6	RF Choke	.1Ω		77279		
L7	UHF IF Trans	.1Ω	.1Ω	77283		

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M1	Crystal	77282	
M2	Switch	46760	UHF-VHF Selector (2 used)
	Antenna Terminal Board	74104	Less Cable
	Adaptor	77275	7 Pin Miniature, Model U1A
	Adaptor	77276	Standard Octal, Model U1B

CHASSIS—BOTTOM VIEW





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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6AF4	†34KΩ	10KΩ	*	*	0Ω	10KΩ	†34KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER (CRITICAL : Varies with test lead characteristic and placement).
† MEASURED FROM B+ INPUT WITH JUMPER ACROSS R5.
ALL VOLTAGES MEASURED WITH 80V AT JUNCTION OF R2 AND R5 (POINT "X")
* DEPENDS ON TYPE OF FILAMENT CIRCUIT WITH WHICH UNIT IS USED.

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SCHEMATIC DIAGRAM

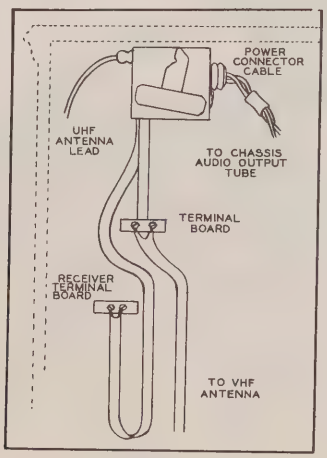


FIG 1

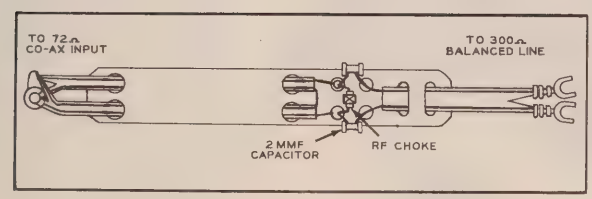


FIG 2

UHF BALUN-TO MATCH 300 OHM BALANCED LINE TO CONVERTER 72 OHM CO-AX INPUT

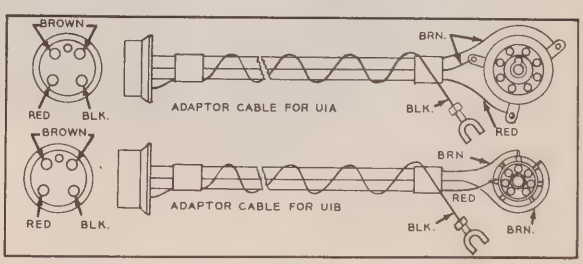


FIG 3

ALIGNMENT ADJUSTMENTS

Before making adjustments check for proper installation of the unit. For an installation using a separate UHF antenna the inputs should be connected as indicated in fig. 1. In some cases it may be possible to use the VHF antenna for UHF reception by connecting a balun as indicated in fig. 2.

If a balun is used in this manner check to see that VHF reception is not impaired.

The 6AF4 oscillator coil is provided with a shorting jumper which allows the selector to tune from channel 45 through 83. If it is desired to receive below channel 45 the jumper must be clipped out and removed, allowing tuning from channels 14 through 44.

Turn receiver on an tune to channel 5 or 6, whichever is vacant in the receiving area.

Set the selector switch to UHF position.

Set the receiver fine tuning to the middle of its range and adjust the volume control until a slight background noise is heard.

Preset A1, A2 and A3 as indicated in the Adjustment Table for the desired UHF channel.

Adjust A3 very slowly until sound is heard from the desired UHF station.

A1 and A2 must be in approximately the correct position in order to obtain sound by adjustment of A3. If unable to obtain sound by adjustment of A3, turn A1 and A2, 1/4 turn in the same direction and again adjust A3 to obtain sound. Repeat this procedure until sound is obtained.

If unable to obtain sound in above manner try connecting one side of the transmission line directly to the crystal at L1 and the other side to chassis.

If sound is heard at two positions of A3, the most clockwise position is correct.

Adjust A1 and A2 for best sound and picture.

Under some conditions interference between the UHF selector oscillator and harmonics of the TV receiver may appear as lines in the picture. It may be possible to eliminate this interference by adjusting the receiver fine tuning to eliminate the beat, then readjust A3 for best sound and picture. As an alternate method, switch receiver to another vacant channel between 2 and 6 and retune A3 for best sound and picture.

In some cases adjacent channel interference may be noted if the VHF station signal is strong and UHF signal is weak. In this instance a shielded cable between the UHF unit and the receiver may prove helpful.

PRELIMINARY ALIGNMENT ADJUSTMENT TABLE

CHANNEL	PRIMARY & SECONDARY A1 AND A2	OSCILLATOR A3
14	6.5 turns CW	1 turn CW
15-16	5.5 turns CW	1 turn CCW
17-19	5.0 turns CW	2 turns CCW
20-23	4.5 turns CW	3 turns CCW
24-27	3.5 turns CW	4 turns CCW
28-32	2.5 turns CW	5 turns CCW
33-37	2.0 turns CW	6 turns CCW
38-41	1.5 turns CW	7 turns CCW
42-44	1.0 turn CW	8 turns CCW
45-46	.5 turn CW	1 turn CW
47-50	.5 turn CCW	1 turn CCW
51-54	1.0 turn CCW	2 turns CCW
55-60	1.5 turns CCW	3 turns CCW
61-67	2.0 turns CCW	4 turns CCW
68-75	2.5 turns CCW	5 turns CCW
76-82	3.0 turns CCW	6 turns CCW
83	3.5 turns CCW	7 turns CCW

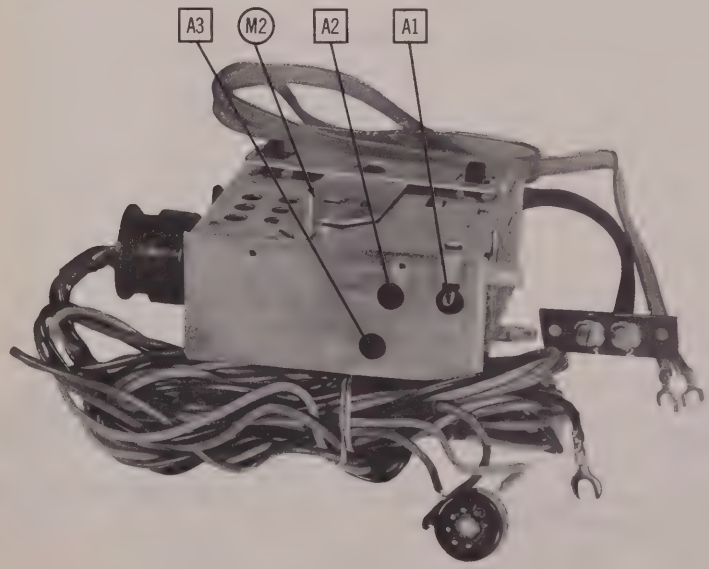
The above indicated adjustments are based on the assumption that the unit is still aligned as it left the factory, i.e., 670MC.
CW indicates clockwise.
CCW indicates counter clockwise.

The table below lists all RCA Victor television receivers to date and data regarding the converter to be employed. The voltage in the receiver, and hence, the voltage at the converter may vary depending on the signal strength, the A-C line voltage, and the particular chassis involved. In some cases, therefore, it may be necessary to employ slightly different values of resistors across R3 than that specified in the table below. In any event, the voltage at the junction of R3 and R5 should be between 60 and 90 volts with the converter shield in place, with the receiver operating, and the desired UHF channel being received.

RECEIVER MODELS	AUDIO OUTPUT		USE SELECTOR	JUMPER ACROSS R5	JUMPER OR RESISTOR ACROSS R3 AND R4
	TUBE	VOLTS			
621TS	6K6GT	200	UIB	Leave In	22K, 1 watt
630TS, 630TCS	6K6GT	265	UIB	Leave In	None
641TV	6F6G	270	UIB	Leave In	None
648PTK	6F6G	270	UIB	Leave In	None
648PV	6F6G	270	UIB	Leave In	None
721TS, 721TCS	6K6GT	200	UIB	Leave In	22K, 1 watt
730TV1, 730TV2	6K6GT	245	UIB	Leave In	None
741PCS	6F6G	250	UIB	Leave In	None
8PCS41	6F6G	250	UIB	Leave In	None
8TS30	6K6GT	245	UIB	Leave In	None
8TV41	6F6G	270	UIB	Leave In	None
8T241, 8T243, 8T244	6K6GT	80	UIB	Leave In	Jumper across R3
8T270, 8TC270, 8TC271	6K6GT	152	UIB	Leave In	6.8K, 0.5 watt
8TR29, 8TK29	6K6GT	80	UIB	Leave In	Jumper across R3
8TK320	6V6GT	152	UIB	Leave In	6.8K, 0.5 watt
8TV321, 8TV323	6V6GT	295	UIB	Leave In	None
9PC41	6F6G	250	UIB	Leave In	None
9T240, 9T240K, 9TC240	6K6GT	80	UIB	Leave In	Jumper across R3
9TC245, 9TS247, 9TC249	6K6GT	80	UIB	Leave In	Jumper across R3
9T246	6K6GT	80	UIB	Leave In	Jumper across R3
9T256	6K6GT	80	UIB	Leave In	Jumper across R3
9T270, 9TC272, 9TC275	6K6GT	152	UIB	Leave In	6.8K, 0.5 watt
9TW309	6V6GT	80	UIB	Leave In	Jumper across R3
9TW333	6V6GT	217	UIB	Leave In	33K, 1 watt
9TW390	6V6GT	210	UIB	Leave In	27K, 1 watt
T100	6K6GT	80	UIB	Leave In	Jumper across R3
T120, T121	6K6GT	80	UIB	Leave In	Jumper across R3
TC124, TC125, TC127	6K6GT	80	UIB	Leave In	Jumper across R3
TA128	6V6GT	80	UIB	Leave In	Jumper across R3
TA129	6V6GT	80	UIB	Leave In	Jumper across R3
T164, TC165, TC166, TC167, TC168	6K6GT	120	UIB	Leave In	5K, 1 watt
TA169	6V6GT	85	UIB	Leave In	Jumper across R3
S1000	6V6GT	210	UIB	Leave In	27K, 1 watt
2T51, 2T61	6AQ5	368	UIA	Leave In	None
2T81	6V6GT	210	UIB	Leave In	27K, 1 watt
4T101	6AQ5	270	UIA	Leave In	None
4T141	6V6GT	210	UIB	Leave In	27K, 1 watt
6T72	6K6GT	120	UIB	Leave In	5K, 1 watt
6T53, 6T54, 6T64, 6T65	6K6GT	360	UIB	Clip Out	None
6T71, 6T74, 6T75, 6T76	6K6GT	360	UIB	Clip Out	None
6T84	6V6GT	210	UIB	Leave In	27K, 1 watt
6T86, 6T87	6V6GT	290	UIB	Leave In	None
7T103, 7T103B, 7T104, 7T104B	6K6GT	360	UIB	Clip Out	None
7T11B, 7T112, 7T112B, 7T122	6K6GT	360	UIB	Clip Out	None
7T122B, 7T123, 7T123B, 7T124	6K6GT	360	UIB	Clip Out	None
7T125B	6K6GT	360	UIB	Clip Out	None
7T132	6AQ5	360	UIA	Leave In	None
7T143	6V6GT	290	UIB	Leave In	None
9T57, 9T77, 9T79	6K6GT	360	UIB	Clip Out	None

RECEIVER MODELS	AUDIO OUTPUT		USE SELECTOR	JUMPER ACROSS R5	JUMPER OR RESISTOR ACROSS R3 AND R4
	TUBE	VOLTS			
9T89	6V6GT	290	UIB	Leave In	None
9T105, 9T126, 9T128	6K6GT	360	UIB	Clip Out	None
9T147	6V6GT	290	UIB	Leave In	None
16T152	6K6GT	360	UIB	Clip Out	None
17T150, 17T151, 17T163	6AQ5	250	UIA	Leave In	None
17T153, 17T154, 17T155, 17T160	6AQ5	250	UIA	Leave In	None
17T162, 17T172, 17T172K, 17T173	6AQ5	250	UIA	Leave In	None
17T173K, 17T174, 17T174K	6AQ5	250	UIA	Leave In	None
17T200, 17T201, 17T202	6K6GT	250	UIB	Leave In	None
17T211, 17T220	6K6GT	250	UIB	Leave In	None
17T250DE, 17T261DE	6AQ5	250	UIA	Leave In	None
21T159, 21T159DE, 21T165	6AQ5	356	UIA	Clip Out	None
21T174DE, 21T176, 21T177	6AQ5	356	UIA	Clip Out	None
21T178, 21T178DE, 21T179, 21T179DE	6AQ5	356	UIA	Clip Out	None
21T197DE	6V6GT	290	UIB	Leave In	None
21T208, 21T217, 21T218	6K6GT	250	UIB	Leave In	None
21T227, 21T228, 21T229	6K6GT	250	UIB	Leave In	None
21T242 See note below	6K6GT	250	UIB	Leave In	None
21T244 See note below	6K6GT	250	UIB	Leave In	None

NOTE: Model 21T242 and 21T244 receivers have separate audio systems for radio and television operation. It is therefore necessary to plug the power cable adapter into the television audio output tube socket rather than into the radio audio system.



CHASSIS—TOP VIEW

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MODEL 9132A

STEWART-WARNER
MODEL 9132A

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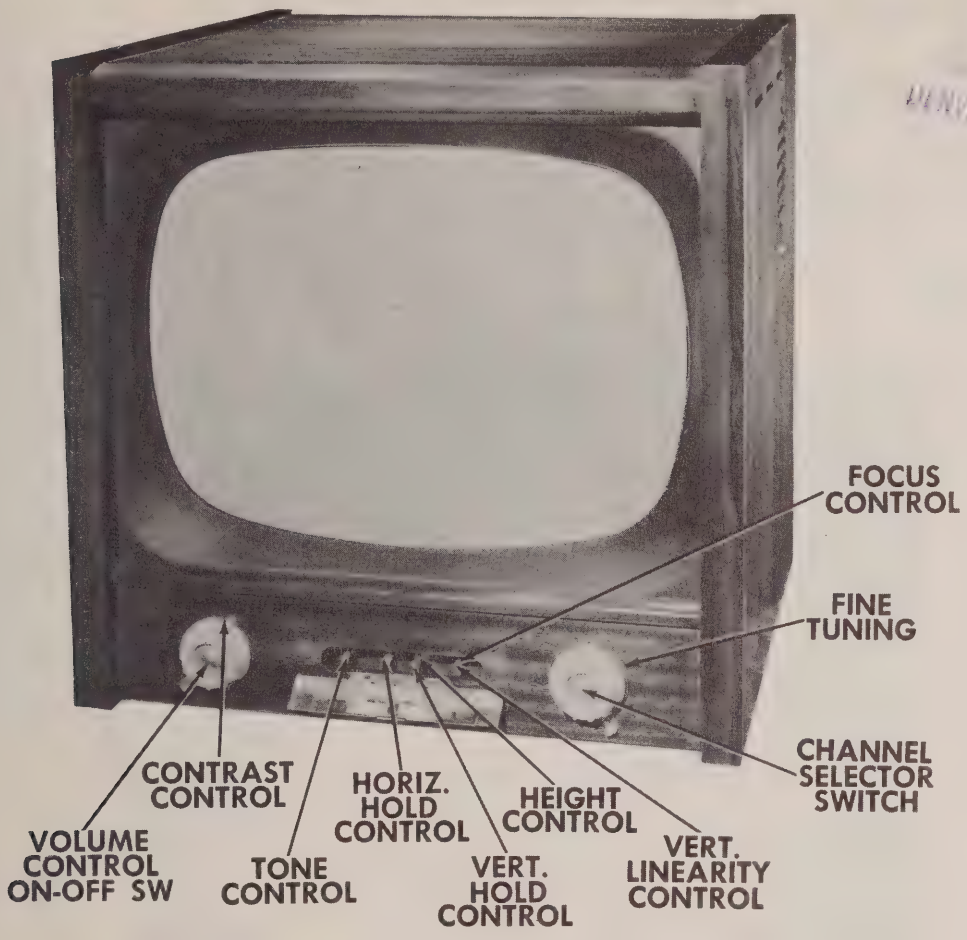
STEWART-WARNER MODEL 9132A



STEWART-WARNER MODEL 9132A

TRADE NAME	Stewart-Warner Model 9132-A
MANUFACTURER	Stewart-Warner Elect. Div. of Stewart-Warner Corp., 1300 No. Kostner Ave., Chicago 15, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-six
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.35 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 Video IF 26.9MC Sound IF 22.4MC (Intercarrier)

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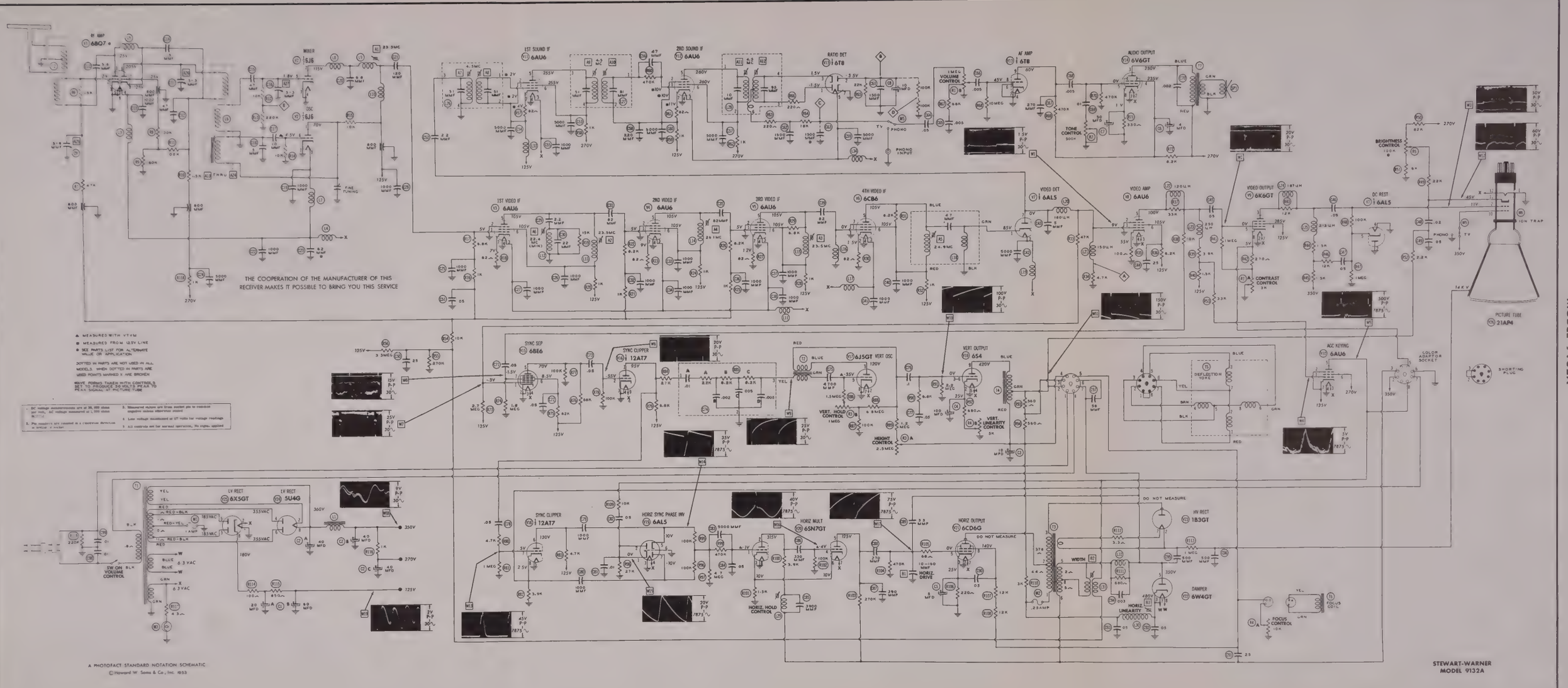
RF AMP V1 6BQ7
MIXER V2 6J6
OSC V3 6J6
1ST SOUND IF V17 6AU6
2ND SOUND IF V18 6AU6
RATIO DET V11 6T8
AF AMP V13 6T8
AUDIO OUTPUT V16 6V6GT
1ST VIDEO IF V3 6AU6
2ND VIDEO IF V4 6AU6
3RD VIDEO IF V5 6AU6
4TH VIDEO IF V6 6CB6
VIDEO DET V7 6AL5
VIDEO AMP V8 6AU6
VIDEO OUTPUT V9 6K6GT
DC REST V7 6AL5
SYNC SEP V15 6BE6
SYNC CLIPPER V16 12AT7
SYNC CLIPPER V16 12AT7
HORIZ SYNC PHASE INV V15 6AL5
VERT OSC V17 6J5GT
VERT OUTPUT V18 6S4
HORIZ MULT V20 6SN7GT
HORIZ OUTPUT V21 6CD6G
ACC KEYING V10 6AU6
LV RECT V20 6X5GT
LV RECT V19 5U4G
HV RECT V22 1B3GT
DAMPER V23 6W4GT
PICTURE TUBE V24 21AP4
ION TRAP
SHORTING PLUG
COLOR ADAPTOR SOCKET
DEFLECTION YOKE
FOCUS COIL
VOLUME CONTROL
TONE CONTROL
PHONO INPUT
BRIGHTNESS CONTROL
CONTRAST CONTROL
HEIGHT CONTROL
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
HORIZ. DRIVE
HORIZ. HOLD CONTROL
WIDTH
HORIZ. LINEARITY
FOCUS CONTROL
FINE TUNING
SW ON VOLUME CONTROL
DO NOT MEASURE
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
● MEASURED FROM 125V LINE
■ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET FOR NORMAL OPERATION AND WITH AN RF MOD. SIGNAL AT PICTURE TUBE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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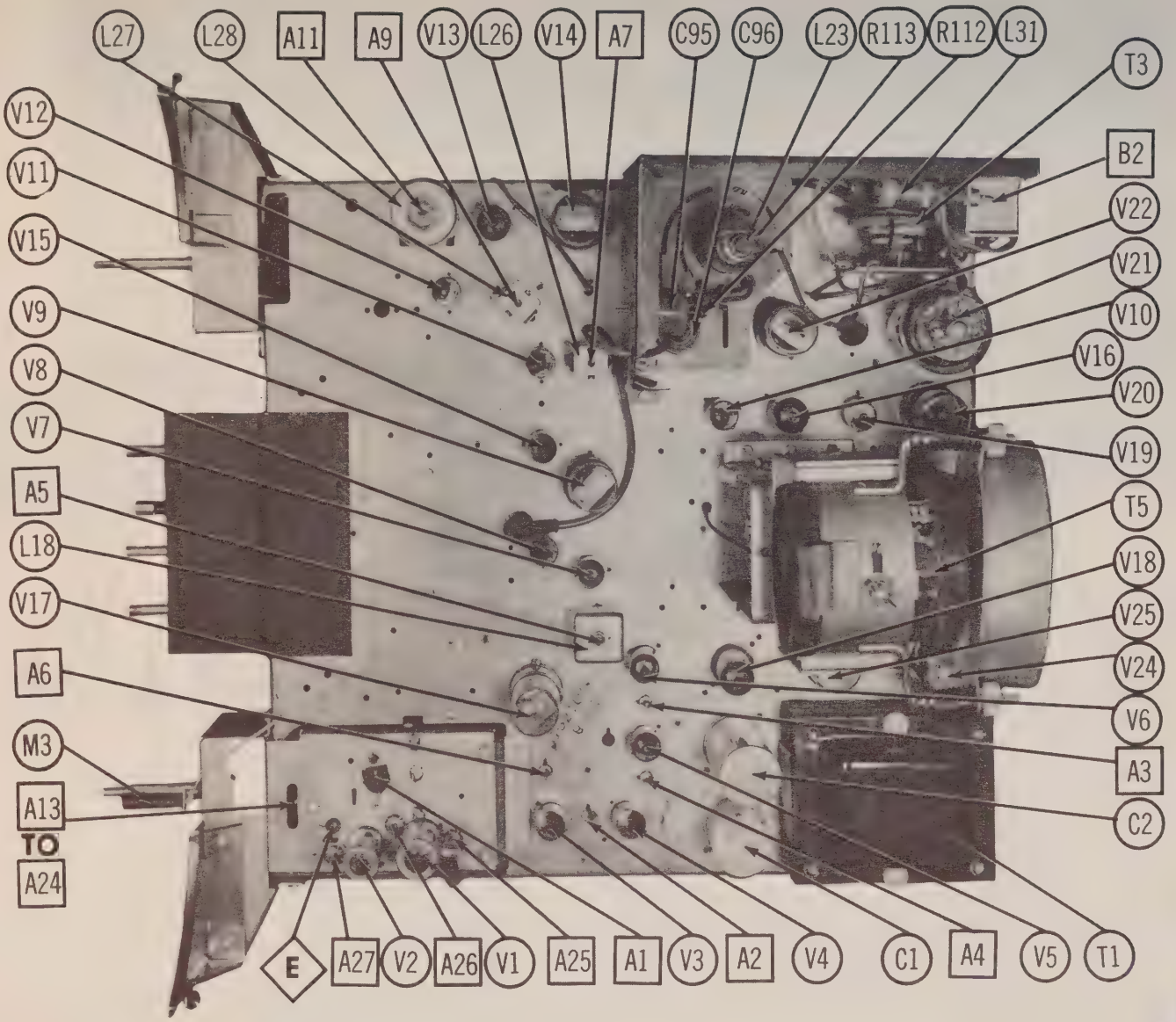

CHASSIS TOP VIEW

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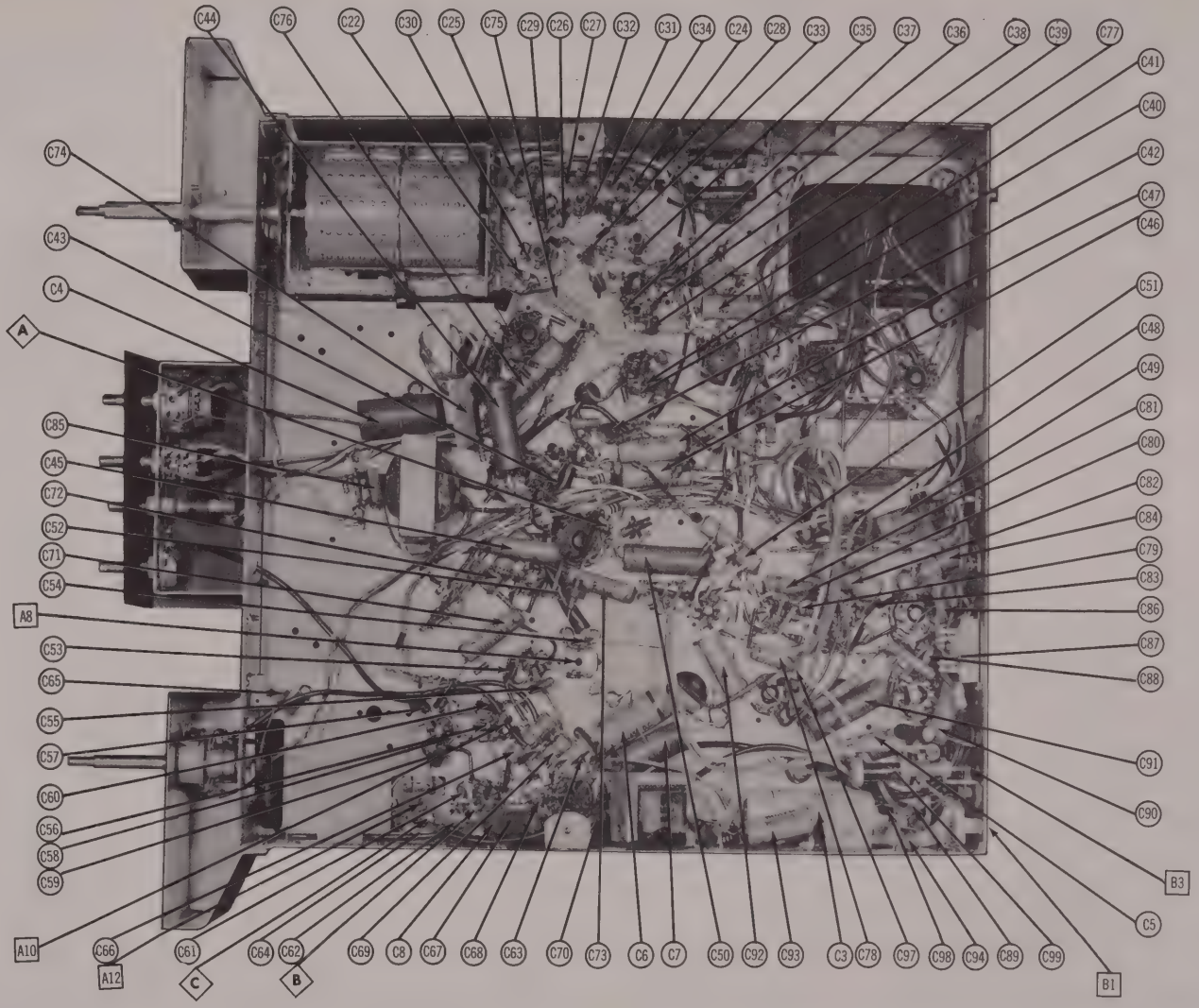
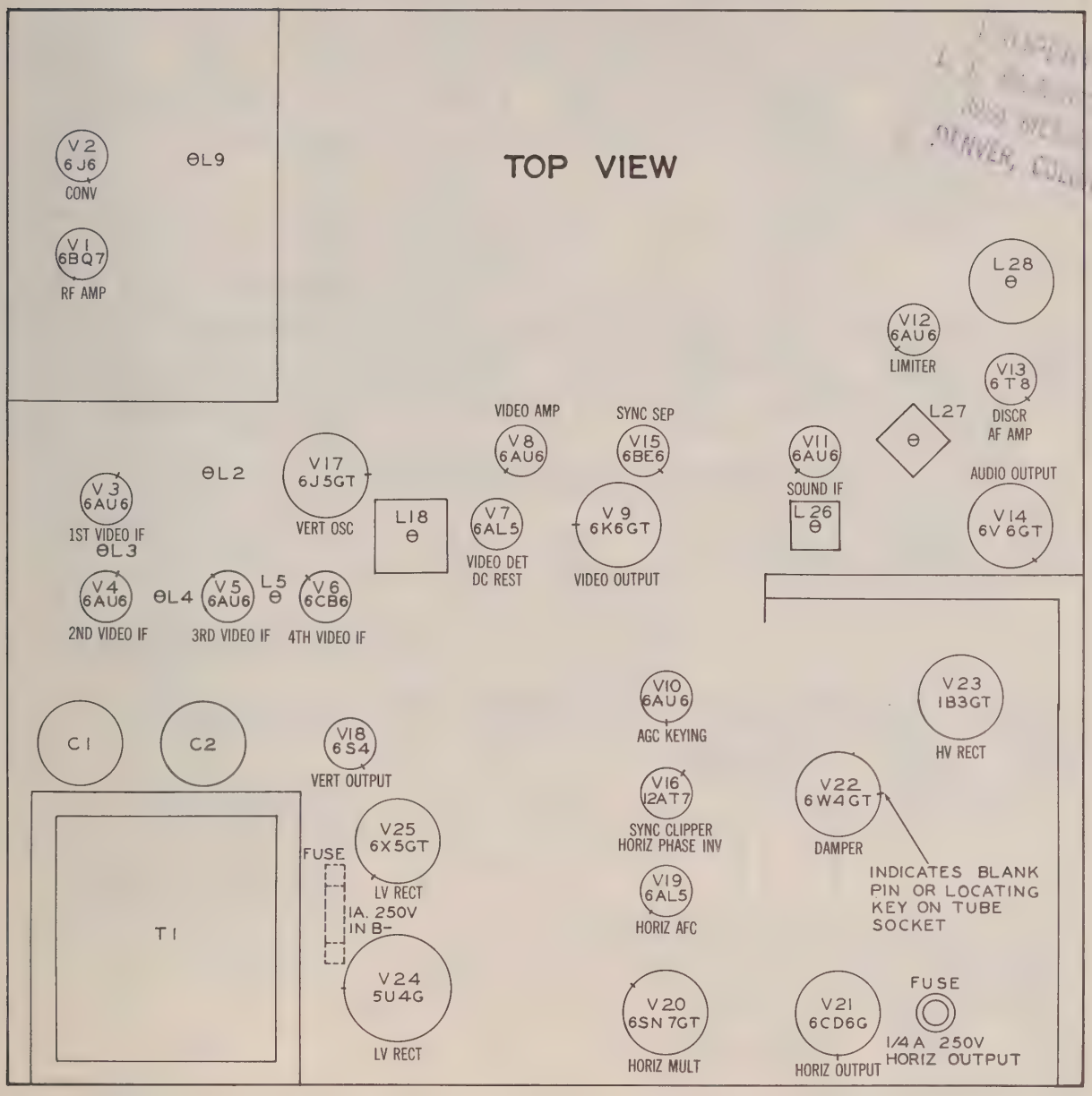


CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V24, V25, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7, V25
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V9, V26
Has pic, no sound - V11, V12, V13, V14
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V16, V17
No horiz. sync - V16, V19, V20
No vert. or horiz. sync - V15, V16

SWEEP FAILURE
No raster; has sound - V20, V21, V22, V23, V26, Fuse (M2)
No vert. deflection - V18
Poor vert. linearity or foldover - V17, V18
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V20, V21, V22, V23, V24
Vert. off freq. - V16, V17
Horiz. off freq. - V16, V19, V20

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube (V20).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed.
This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C50. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.5MC (Unmod.)	Any	DC probe to point ◇A◇. Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	26.1MC	"	"	A4	"
3.	"	"	24.9MC	"	"	A5	"
4.	"	"	22.4MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	22.4MC 23.4MC 26.9MC	Any	Vert. amp. to point ◇A◇. Low side to chassis.		Check for response similar to fig. 1. If necessary, retouch A1 through A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point ◇B◇ to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ◇B◇. Common to Chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point ◇C◇. Common to point ◇D◇.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001mfd	High side to point ◇A◇. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point ◇B◇. Low side to chassis.	A7, A8, A9, A10, A11	Disconnect stabilizer capacitor C8. Adjust for curve of maximum amplitude and symmetry as in fig. 2.
7.	"	"	"	"	"	Vert. amp. to point ◇C◇. Low side to chassis.	A12	Reconnect capacitor C8. Adjust so that 4.5MC occurs at center of crossover lines as in fig. 3. SLIGHTLY retouch all for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscillator for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. to point ◇A◇. Low side to chassis.	A13	Increase scope gain to make sound trap. Notch visible on response curve. Adjust to place sound marker in trap notch as in fig. 4.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A25, A26 A27	Adjust for response curve similar to fig. 5.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to fig. 5. If markers fall below 70% on any channel make slight compromise adjustments of A25, A26 A27 with channel switch set to that channel. Recheck other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

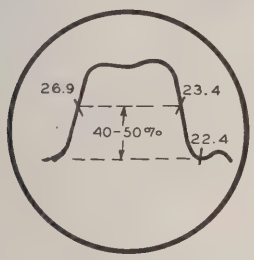


FIG. 1

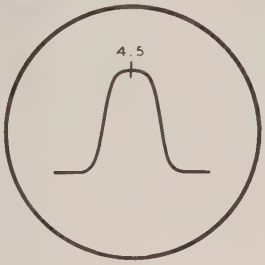


FIG. 2

FIG. 3

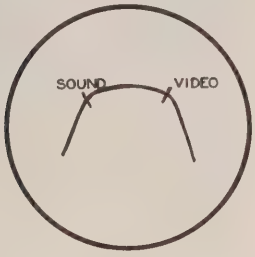


FIG. 5

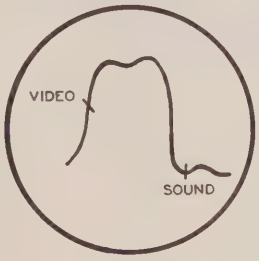
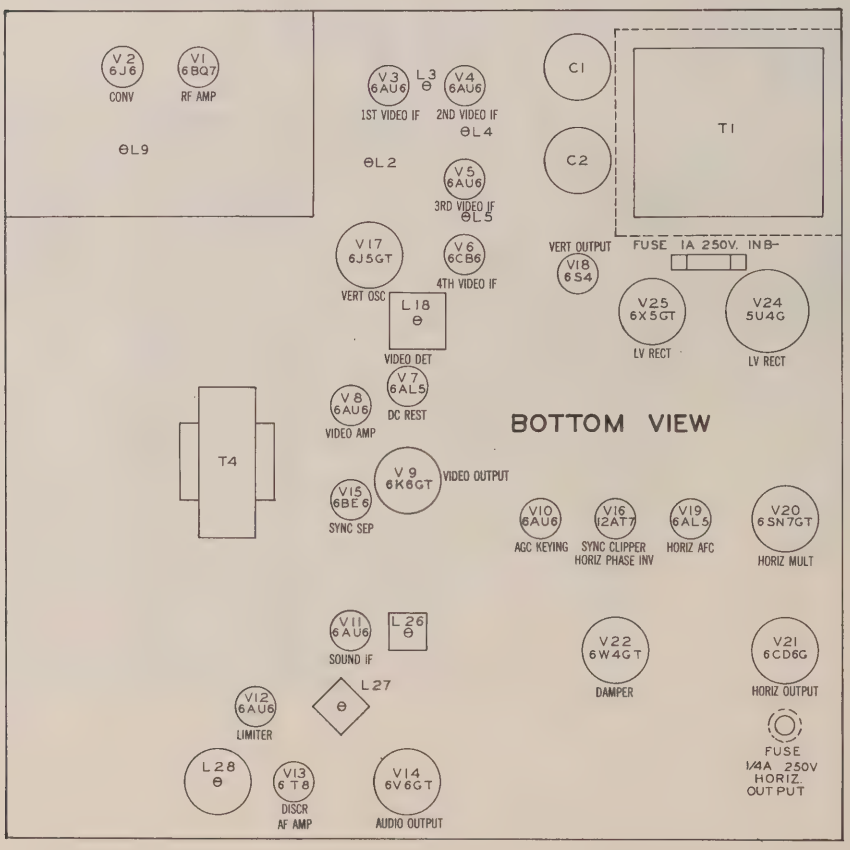


FIG. 4

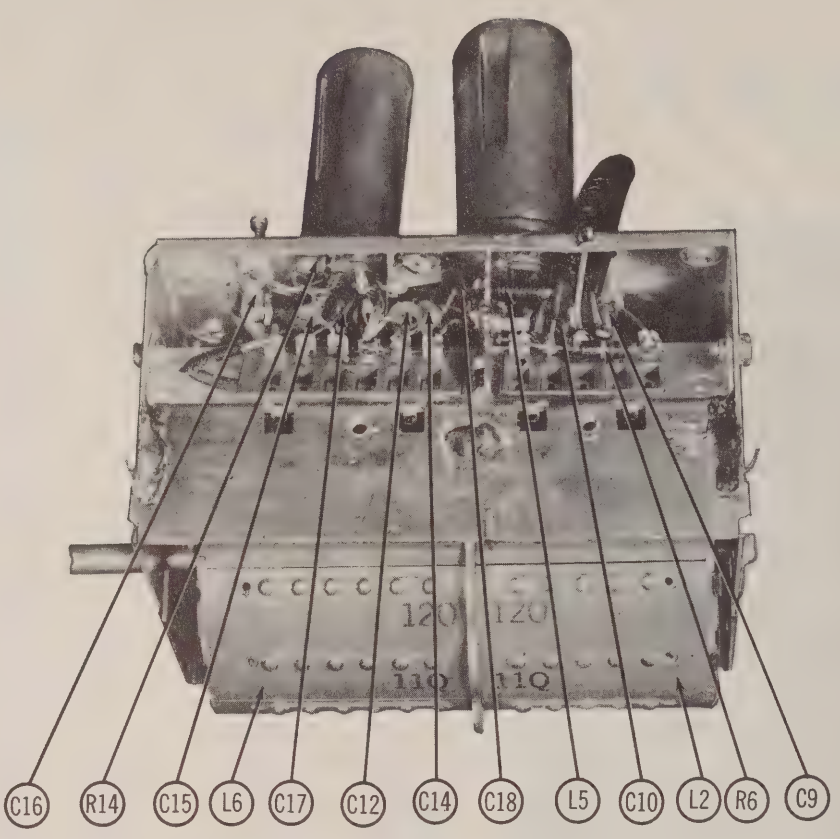
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	330KΩ	0Ω	.1Ω	0Ω	† 3.6KΩ	† 175KΩ	INF	
V 2	6J6	#11KΩ	#950Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AU6	290KΩ	0Ω	.1Ω	0Ω	#1.9KΩ	#1.9KΩ	82Ω		
V 4	6AU6	290KΩ	0Ω	.1Ω	0Ω	#1.9KΩ	#1.9KΩ	82Ω		
V 5	6AU6	290KΩ	0Ω	.1Ω	0Ω	#1.9KΩ	#1.9KΩ	82Ω		
V 6	6CB6	2.2Ω	82Ω	.1Ω	0Ω	#1.9KΩ	#1.9KΩ	0Ω		
V 7	6AL5	2.2Ω	0Ω	.1Ω	0Ω	1Meg.	0Ω	4.7KΩ		
V 8	6AU6	4.7KΩ	0Ω	.1Ω	0Ω	#6.4KΩ	#9.2KΩ	100Ω		
V 9	6K6GT	1Meg.	0Ω	† 3KΩ	# 950Ω	1Meg.	50KΩ	.1Ω	2.4KΩ	
V 10	6AU6	#35KΩ	#950Ω	.1Ω	0Ω	270KΩ	† 1.1KΩ	#950Ω		
V 11	6AU6	#950Ω	#950Ω	.1Ω	0Ω	† 2KΩ	† 2KΩ	#1.1KΩ		
V 12	6AU6	#470KΩ	#1.9KΩ	.1Ω	0Ω	† 2KΩ	† 2KΩ	#2KΩ		
V 13	6T8	INF	22KΩ	INF	0Ω	.1Ω	0Ω	0Ω	10Meg.	† 480KΩ
V 14	6V6GT	INF	.1Ω	† 1.7KΩ	† 9.3KΩ	470KΩ	† 1.1KΩ	0Ω	330Ω	
V 15	6BE6	50KΩ	0Ω	0Ω	.1Ω	#53KΩ	#82KΩ	1.8Meg.		
V 16	12AT7	#7.8KΩ	100KΩ	0Ω	0Ω	0Ω	#5.7KΩ	1Meg.	3.9KΩ	.1Ω
V 17	6J5GT	0Ω	.1Ω	■1.7Meg.	INF	2.2Meg.	INF	0Ω	0Ω	
V 18	6S4	INF	1.6KΩ	2.2Meg.	.1Ω	0Ω	2.2Meg.	INF	INF	■4.1KΩ
V 19	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 20	6SN7GT	5.1Meg.	† 4KΩ	1.5KΩ	100KΩ	† 270KΩ	1.5KΩ	.1Ω	0Ω	
V 21	6CD6G	INF	0Ω	220Ω	INF	470KΩ	470KΩ	.1Ω	† 24KΩ	Top Cap ■48.5Ω
V 22	6W4GT	INF	INF	3.5Meg.	INF	† 80Ω	† 86Ω	3.5Meg.	3.5Meg.	
V 23	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ■425Ω
V 24	5U4G	1.4Ω	13KΩ	INF	22.8Ω	.1Ω	20.8Ω	220KΩ	13KΩ	
V 25	6X5GT	INF	.1Ω	10Ω	INF	11.4Ω	† 41KΩ	0Ω	130KΩ	
V 26	21AP4	0Ω	1.1Meg.	Pin 10 † 73Ω	Pin 11 59KΩ	Pin 12 .1Ω				

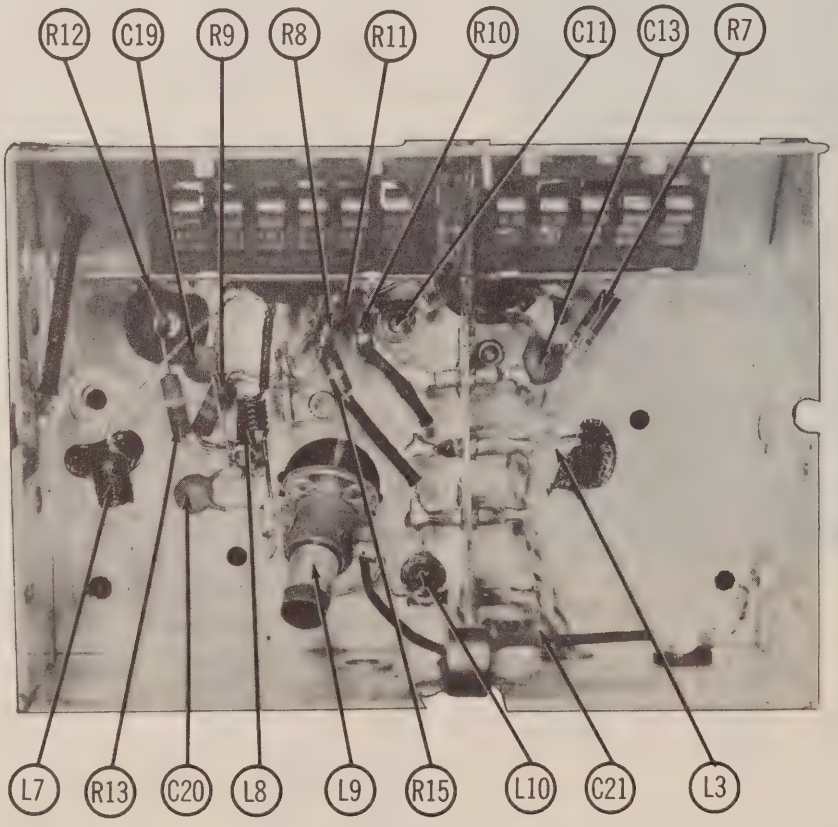
† MEASURED FROM PIN 8, V24.
# MEASURED FROM PIN 8, V25.
■ MEASURED FROM PIN 3, V22.



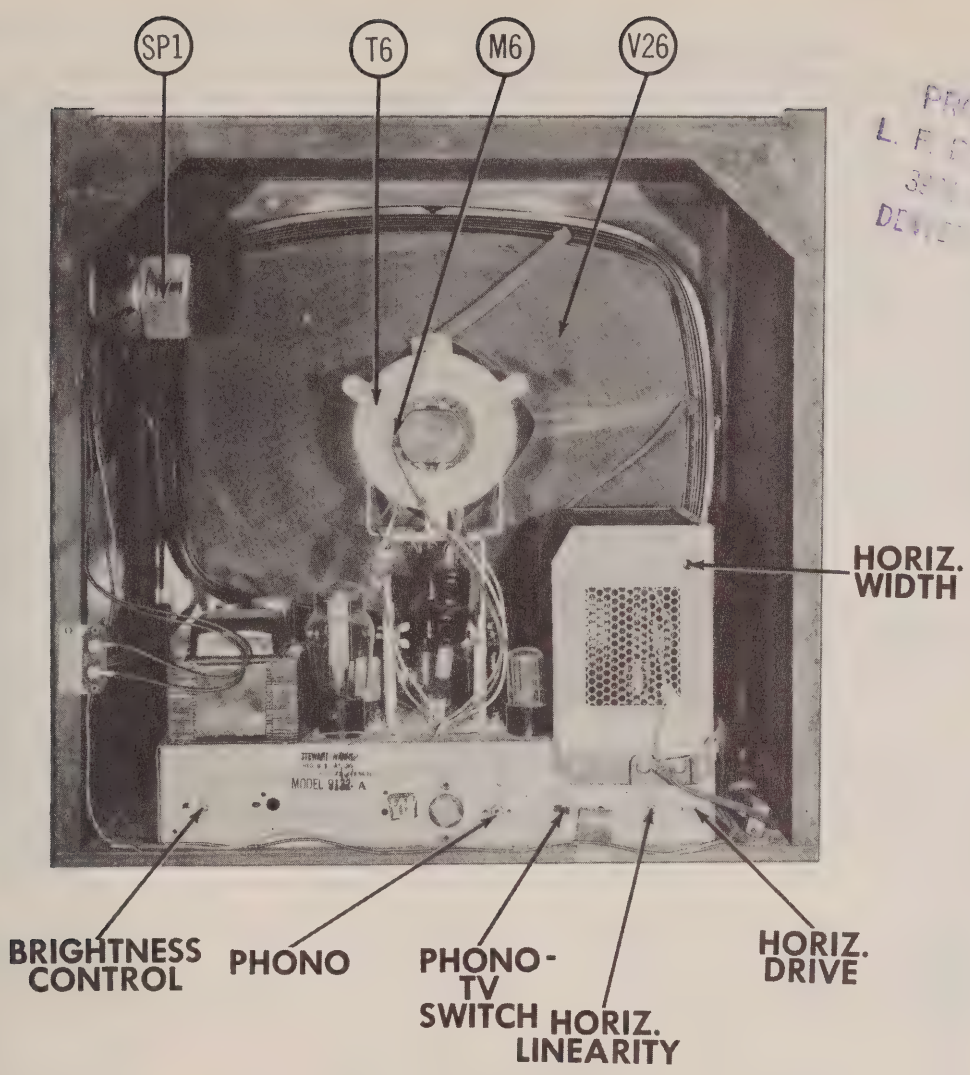
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



PROPERTY OF
L. F. DANKENSHIN

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the hold control until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) counter clockwise as far as possible without the presence of a vertical white line or compression of the center of picture. If neither of these indications are noted set at the minimum capacity which still maintains some compression of the trimmer plates.

Adjust the width control slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in antenna. Loosen 2 wood screws. Remove antenna bracket.
4. Remove 2 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Stewart-Warner Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7	6BQ7	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector				
	DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier	6AU6	6AU6	7BK	
V9	Video Output	6K6GT	6K6GT	7S	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amplifier	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Discriminator				
	AF Amplifier	6T8	6T8	9E	
V14	Audio Output	6V6GT	6V6GT	7S	
V15	Sync Separator	6BE6	6BE6	7CH	
V16	Sync Clipper-Horiz. Sync Phase Inv.	12AT7	12AT7	9A	
V17	Vert. Oscillator	6J5GT	6J5GT	6Q	
V18	Vert. Output	6S4	6S4	9AC	
V19	Horiz. AFC	6AL5	6AL5	6BT	
V20	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V21	Horiz. Output	6CD6G	6CD6G	5BT	
V22	Damper	6W4GT	6W4GT	4CG	
V23	HV Rectifier	1B3GT	1B3GT	3C	
V24	LV Rectifier	5U4GT	5U4GT	5T	
V25	LV Rectifier	5X5GT	5X5GT	6S	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Stewart-Warner Part No.	REPLACEMENT DATA: SYLVANIA		RTMA BASE TYPE	NOTES
V26	21AP4	21AP4		I2D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stewart-Warner Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C1A	±20	300	508073	AFH2-60		B046			FP396	TVL-3640	
B	±60	300									
C2A	±40	450		AFH3-44		C035			FP377	TVL-3787	
B	±40	450									
C	±40	450									
C3	10	600	508680	PRS700/10			BHV810		TC92	TVA-1955	
C4	100	50	508682	PRS50/100			BHR501		TC3501	TVA-1310	
C5	5	50	508684	PRS150/4			BR550		TC30	TVA-1303	
C6	4	450	504719	PRS450/4			BR445		TC70	TVA-1702	
C7	50	25	502527	PRS25/50			BR50A		TC29	TVA-1206	
C8	10	150	505174	PRS150/12			BR1015		TC42	TVA-1406	
C9	9-9		509064			829-10					
C10	9-6		510731					NP0K-3R6			
C11	5-3		507968			829-3			CT65A		
C12	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447		5GA-Q47	
C13	1000		502725	BPD-001	DD-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C14	.5		520720	S11.5NP0	TCZ-1.5		NP0K-1R5	Z7-5415		5TCCB-V15	
C15	47		520719	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447		5GA-Q47	
C16	5-3				829-3				CT65A		
C17	10		520718	S10N750	TCN-10		N750K-100	NT-541		5TCU-Q1	
C18	5		520717	S15NP0	TCZ-5		NP0K-050	Z7-555		5TCCB-V47	
C19	1000		520735	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C20	6.8			S16 8NP0	TCZ-6.8		NP0K-6R8			5TCCB-V68	
C21	120		513029	S1120	D6-121	TM5T12	GP2K-121	UC-5312		5GA-T12	
C22	1000		510734	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C23	82		513016	S182			GP1K-820			5GA-Q82	Note 1.
C24	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	
C25	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C26	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C27	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C28	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C29	2.2		513001		TCZ-2.2		NP0K-2R2			5TCCB-V22	
C30	22		513445		TCZ-22		NP0K-220			5TCC-Q22	
C31	82		513016	S182			GP1K-820			5GA-Q82	
C32	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C33	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C34	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C35	82		513016	S182			GP1K-820			5GA-Q82	
C36	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C37	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C38	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C39	82		513016	S182			GP1K-820			5GA-Q82	
C40	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C41	1000		513009	S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C42	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	
C43	5		513432	S15NP0	TCZ-4.7		NP0K-050	Z7-555		5TCCB-V47	
C44	.25	200	512045	P488-25		PTE4P25		PT4025		2TM-P25	
C45	.05	200	512027	P288-05	DF-503	PJ2S5		PT415		2TM-S5	
C46	.05	600	512031	P688-05	DF-503	PTE6S5		PT615		6TM-S5	
C47	.05	600	512031	P688-05	DF-503	PTE6S5		PT615		6TM-S5	
C48	.02	200		P288-02	DF-203	PJ2S3		PT412		2TM-S2	
C49	.05	600		P688-05	DF-503	PTE6S5		PT615		6TM-S5	
C50	.25	200	512045	P488-25		PTE4P25		PT4025		2TM-P25	
C51	.05	200	512027	P288-05	DF-503	PJ2S5		PT415		2TM-S5	
C52	2.2		513001		TCZ-2.2		NP0K-2R2			5TCCB-V22	
C53	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	
C54	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	
C55	1000			S1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1	
C56	47		513433	S147	D6-470	TM5Q5	GP1K-470	UC-5447		5GA-Q47	
C57	5000			BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	
C58	220			S1220	D6-221	5W5T25	GP2K-231	UC-5322		5GA-T22	
C59	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525		5HK-D5	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stewart-Warner Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C60	5000		513013	BPD-005	DD-502	TM5D5	S11-005	DC-525	5HK-D5	
C61	1500		513010	S1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C62	1500		513010	S1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C63	1500		513010	S1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	Note 1.
C64	.05	200	512027	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C65	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C66	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C67	270	500	513006	1468-0003	D6-271	5W5T3	GP1K-271	MC241	1TM-33	
C68	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C69	.01	300	512009	P488-01	D6-103	PTE4B1	GP2-333-103	PT411	4TM-S1	
C70	.002	600	512003	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C71	.05	200	512027	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C72	.05	300	512027	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C73	.05	200	512027	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C74A	.01			P688-01			PTE6S1		PT611	
B	.002	600		P688-002		† PC-100	PTE6D3	‡ 1405-01	PT622	*101C1
C	.005			P688-005		DD-103	PTE6D5	821-01	PT625	5HK-S1
D	.006		*508062	P688-005			PTE6D5		PT625	
C75	4700	500	512533	1464-005			IDR5D5		MCB465	MS-25
C76	.1	600	512037	P688-1	DF-104		PTE6P1		PT611	6TM-P1
C77	.05	600	512036	P688-05	DF-503		PTE6S5		PT615	6TM-S5
C78	.05	200	512039	P288-05	DF-503		PJ2S5		PT415	2TM-S5
C79	1000		513009	S1000	D6-102		TM5D1	GP2L-102	UC-521	5HK-D1
C80	1000		513009	S1000	D6-102		TM5D1	GP2L-102	UC-521	5HK-D1
C81	.05	600	512031	P688-05	D6-103		PTE6S5	GP2L-333-103	PT611	6TM-S5
C82	.05	600	512031	P688-05	DF-503		PTE6S5		PT615	6TM-S5
C83	5000		513013	BPD-005	DD-502		TM5D5	S11-005	DC-525	5HK-D5
C84	.05	200	512027	P288-05	DF-503		PJ2S5		PT415	2TM-S5
C85	3900	500	512540	1464-004			IDR5D4		MCB463	MS-24
C86	330	500	512541	1469-0003S						
C87	390	500	512535	1469-0004			5R5T4		MCB243	MS-34
C88	270	500	512536	1469-0003			5R5T3		MCB241	MS-33
C89	3.3	1500	513025							
C90	.05	600	512031	P688-05		DF-503	PTE6S5		PT615	6TM-S5
C91	.25	300	513045	P488-25			PTE4P25		PT4025	2TM-P25
C92	.05	600	512031	P688-05			PTE6S5		PT615	6TM-S5
C93	.05	600	512031	P688-05			PTE6S5		PT615	6TM-S5
C94	.003	600	512005	P688-003		D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3
C95	500	20000	508888	HV20C		TV3-502	MM-C20T5	413-501		20DK-T5
C96	500	20000	508888	HV20C		TV3-502	MM-C20T5	413-501		20DK-T5
C97	56	1500	513027							
C98	.01	400	512255	489ZGXY-01			PJ4S1		PT411	4TM-S1
C99	.01	400		489ZGXY-01			PJ4S1		PT411	4TM-S1

Note 1. Not used in all models.
* Items C74A, C74B, C74C, C74D, R85A, R85B, R85C are combined in one unit.
† Install DD-103 in series with PC-100 input lead to replace original unit.
‡ Install 821-01 in series with 1405-01 input lead to replace original unit.
* Install SHK-S1 in series with 101C1 input lead to replace original unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stewart-Warner Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	3000Ω	4	520683					Contrast-Wire Wound-Panel
B	1Meg	½						Volume & Sw.-Tapped @ 220KΩ-Rear
R2A	500KΩ	½	520651	Q11-133	AG-58-8	AB-59	U-50	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-6	Not Req.	Attach to R2A
R3A	2.5Meg	½	508893	Q2-223*	RTV-313		UF255L	Height-Panel
B	1Meg	½					UR16L	Vert. Hold-Rear
R4A	10KΩ	½	509302		RTV-341			Focus-Wire Wound-Panel
B	500Ω	½						Vert. Linearity-Rear
R5A	100KΩ	½	520652	Q11-128	AG-49-8	AB-40	SU-41	Brightness-See Note
B	Shaft		Not Req.	Not Req.	KS1-1/4	AK-1	Not Req.	Attach to R5A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS, B11-239 & P1-112 (Panel)
B11-137 & R1-115 (Rear).

Note: Some Models use alternate control (Part #520642).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: Stewart-Warner Part No.	IRC Part No.	NOTES
R6	15KΩ	½	510157		
R7	47KΩ	½	510167		
R8	100KΩ	½	510172		
R9	180KΩ 5%	½	510774		
R10	1500Ω	½	510139	BTS-1500	
R11	100KΩ 5%	½	510751		
R12	10KΩ	½	510154		
R13	220KΩ	½	510178		
R14	10KΩ	½	510154	BTS-10K	
R15	10KΩ	½	510154	BTS-10K	
R16	1000Ω	½	510137	BTS-1000	
R17	6800Ω	½	510151		
R18	82Ω	½	510117	BTS-82	
R19	15KΩ	½	510157	BTS-15K	
R20	1000Ω	½	510137	BTS-1000	
R21	1000Ω	½	510137	BTS-1000	
R22	82000Ω	½	510153		
R23	82Ω	½	510117	BTS-82	
R24	1000Ω	½	510137	BTS-1000	
R25	1000Ω	½	510137	BTS-1000	
R26	82000Ω	½	510153		
R27	82Ω	½	510117	BTS-82	
R28	1000Ω	½	510137	BTS-1000	
R29	6800Ω	½	510151		
R30	82Ω	½	510117	BTS-82	
R31	82000Ω	½	510153		
R32	1000Ω	½	510137	BTS-1000	
R33	47KΩ	½	510166	BTS-47K	
R34	47000Ω	½	510648	BTS-47000	
R35	100Ω	½	510149	BTS-100	
R36	8200Ω	1	510253	BTA-8200	
R37	33KΩ	½	510163	BTS-33K	
R38	10KΩ	½	510155	BTS-10K	
R39	3900Ω	½	510147	BTS-3900	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Stewart-Warner Part No.	IRC Part No.	NOTES
R40	1500Ω	½	510139	BTS-1500	
R41	1Meg	½	510191	BTS-1Meg	
R42	270Ω	½	510126	BTS-270	
R43	12KΩ	½	510723	BTS-12K	
R44	1500Ω	2	510339	BTB-1500	
R45	1500Ω	2	510339	BTB-1500	
R46	12KΩ	½	510156	BTS-12K	
R47	1Meg	½	510191	BTS-1Meg	
R48	100KΩ	½	510173	BTS-100K	
R49	22KΩ	½	510161	BTS-22K	
R50	82KΩ	½	510171	BTS-82K	
R51	18KΩ	½	510159	BTS-18K	
R52	3200Ω	½	510143	BTS-3200	
R53	33KΩ	½	510164	BTS-33K	
R54	10KΩ	½	510155	BTS-10K	
R55	270KΩ	½	510180	BTS-270K	
R56	3.3Meg	½	510194	BTS-3.3Meg	
R57	82Ω	½	510117	BTS-82	
R58	1000Ω	½	510137	BTS-1000	
R59	1000Ω	½	510137	BTS-1000	
R60	470KΩ	½	510185	BTS- 470K	
R61	82Ω	½	510117	BTS-82	
R62	1000Ω	½	510137	BTS-1000	
R63	220Ω	½	510124	BTS-220	
R64	18KΩ	½	510159	BTS-18K	
R65	22KΩ	½	510160	BTS-22K	
R66	220Ω	½	510124	BTS-220	
R67	68KΩ	½	510170	BTS-68K	
R68	10Meg	½	510197	BTS-10Meg	
R69	470KΩ	½	510185	BTS-470K	
R70	470KΩ	½	510185	BTS-470K	
R71	330Ω	1	510227	BTA-330	
R72	8200Ω	½	510153	BTS-8200	
R73	2.7Meg	½	510772	BTS-2.7Meg	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Stewart-Warner Part No.	IRC Part No.	NOTES
R74	1.8Meg	½	510743	BTS-1.8Meg	
R75	82KΩ	½	510171	BTS-82K	
R76	68KΩ	½	510169	BTS-68K	
R77	100KΩ	½	510172	BTS-100K	
R78	100KΩ	½	510172	BTS-100K	
R79	6800Ω	½	510151	BTS-6800	
R80	4700Ω	½	510149	BTS-4700	
R81	1Meg	½	510191	BTS-1Meg	
R82	390Ω	½	510147	BTS-3900	
R83	4700Ω	½	510148	BTS-4700	
R84	27KΩ	½	510162	BTS-27K	
R85A	22KΩ	½		BTS-22K	
B	820Ω	½	*508062	BTS-8200	
C	820Ω	½		BTS-8200	
R86	1.5Meg	½	510767	BTS-1.5Meg	
		5%			
R87	100KΩ	½	510786	BTS-100K	
R88	6.8Meg	½	510771	BTS-6.8Meg	
R89	1.2Meg	½	510770	BTS-1.2Meg	
R90	6800Ω	½	510151	BTS-6800	
R91	2.2Meg	½	510193	BTS-2.2Meg	
R92	680Ω	½	510153	BTS-680	
R93	560Ω	½	510132	BTS-560	
R94	560Ω	½	510132	BTS-560	
R95	100KΩ	½	510172	BTS-100K	

* Items R85A, R85B, R85C, C74A, C74B, C74C, C74D are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Stewart-Warner Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.
T1	117VAC @ 2.35A	710VCT .220ADC	5VAC @ 3A	6.3VAC @ 10.5A SEC. 4 tap @ 366VCT .075ADC	509879				
				6.3VAC @ 1.7ADC SEC. 2					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Stewart-Warner Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.	NOTES
T2	153Ω	940Ω	508706	A-8125	A-3000 ①	TBO-1 ②	A-97X ①	Vert. Osc. Trans.
T3	420Ω tap @ 44Ω	7.5Ω tap @ 5Ω SEC. 2	508679	A-8130	HVO-7	TFB-5	D-14	Horiz. Output Trans.
		0Ω						
T4	1100Ω tap ⑥ 13Ω			A-8123	A-3037	TSO-8 ④	A-102X	Vert. Output Trans.
T5A	16Ω		115185 ④	DY-9	MDF-70 ⑤	TY-5	Y-17 ⑤	Horiz. Deflection Coils
B	48Ω							Vert. Deflection Coils
T6	12KΩ		163326 ④					Focus Coil

1. Drill one new mounting hole.
2. Mount on top of chassis.
3. Tie brown and blue leads together.
4. Includes cable and plug.
5. Remove MDF-70 shunting resistors and capacitor
6. Remove Y-17 shunting resistors and capacitor

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Stewart-Warner Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.	NOTES
T7	6KΩ	3.5Ω	630Ω	.9Ω	505912	A-3823 ⊥	A-3019	HO-9 ⊥	S-5X ⊥	⊥ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Stewart-Warner Part No.	JENSEN Part No.	QUAM Part No.	NOTES
SP1	8"	PM	8.5Ω	508157	ST-108 Mod. P6-X	6A1	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ⁰C.)	REPLACEMENT DATA: Stewart-Warner Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.
L1	250A	73Ω	2.9 Hy.	508341	C-2325	C-2991 ⊥	TR-3300 ⊥	C-17X

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Stewart-Warner Part No.	MERIT Part No.	IRC Part No.	NOTES
L2	Ant. Coil	0Ω	0Ω	520702			Channel 2
L3	Fil. Choke	0Ω		520518			
L4	Fil. Choke	0Ω		507584			
L5	Neutralizing Coil	0Ω		520701			
L6	RF, Mixer Grid & Osc. Coil	0Ω		520722			Channel 2
L7	Fil. Choke	0Ω		520520			
L8	RF Choke	0Ω		520714			
L9	1st. Video IF	.9Ω		520734	TV-103 ⊕		Includes slug, Part #509062
L10	RF Choke	1.2Ω		520715			
L11	Fil. Choke	0Ω		507584			

PARTS LIST AND DESCRIPTIONS (Continued)

RF-IF (COILS) CONT.

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Stewart-Warner PART No.	MERIT PART No.	IRC PART No.	
L12	22.4MC Trap	.1Ω		520341	TV-112 ■		Includes slug, part #507357
L13	2nd. Video IF	.1Ω		507343	TV-103		Less slug, Part #507357
L14	3rd. Video IF	.1Ω		507343	TV-102		Less slug, Part #507357
L15	4th. Video IF	.1Ω		507343	TV-103■		Less slug, Part #507357
L16	RF Choke	2.2Ω		507367			
L17	Fil. Choke	.22Ω		507587		CLA	.47 Microhenry
L18	5th. Video IF *	.1Ω		507591			Less core, part #507357
L19	Fil. Choke	.8Ω		507586		CLA	1 Microhenry
L20	Series Peaking Coil	13Ω		520620	TV-184		180 Microhenries
L21	Shunt Peaking Coil	11Ω		520621	TV-184		150 Microhenries
L22	Series Peaking Coil	7.8Ω		520643	TV-181		120 Microhenries
L23	Shunt Peaking Coil	22Ω		520622	TV-185		250 Microhenries
L24	Series Peaking Coil	4.4Ω		508069	TV-184		187 Microhenries
L25	Shunt Peaking Coil	5.5Ω		508070	TV-184		213 Microhenries
L26	1st. Sound IF	2Ω	2Ω	508061	TV-113		
L27	2nd. Sound IF	2Ω	2Ω	508061	TV-113		
L28	Ratio Det.	3.8Ω	.7Ω CT	509706	TV-115 ‡		Tertiary Winding - .45Ω
L29	Horiz. Osc.	85Ω		508967	TV-163		Includes slug, part #508963
L30	Horiz. Lin.	4.5Ω		162190	MWC-2		Includes slug, part 507429
L31	Width Coil	30Ω	38Ω	508667	MWC-1		Includes slug, part #508784
L32	Anti-ringing coil	5.5Ω		509615	TV-180		60 Microhenries
L33	RF Choke	15Ω		507373	TV-184		160 Microhenries
L34	Fil. Choke	.8Ω		507586		CLA	1 Microhenries

* Includes 47MMF capacitor & Cathode Choke
■ Enlarge mounting hole
‡ Use adaptor plate

FUSES

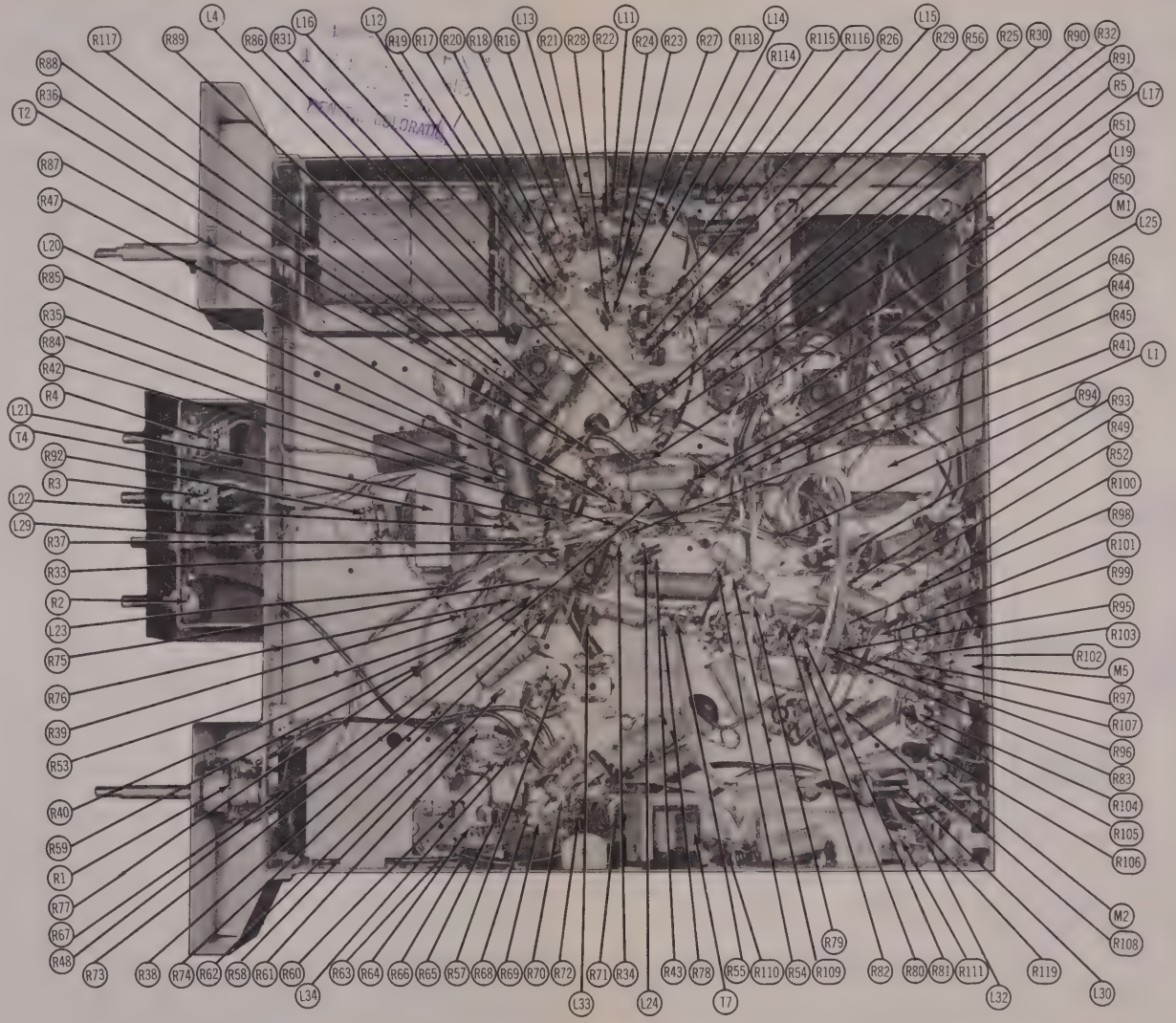
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Stewart-Warner PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG (P/T)	1A. 250V.	509517		318001		GJV-1	
M2	3AG	1/4A. 250V.	508713	508714	312.250	155020	AGC-1/4	HDJ-A

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Stewart-Warner PART No.		
M3	Bayonet	6-8	.15	Brown	118921		Type #47

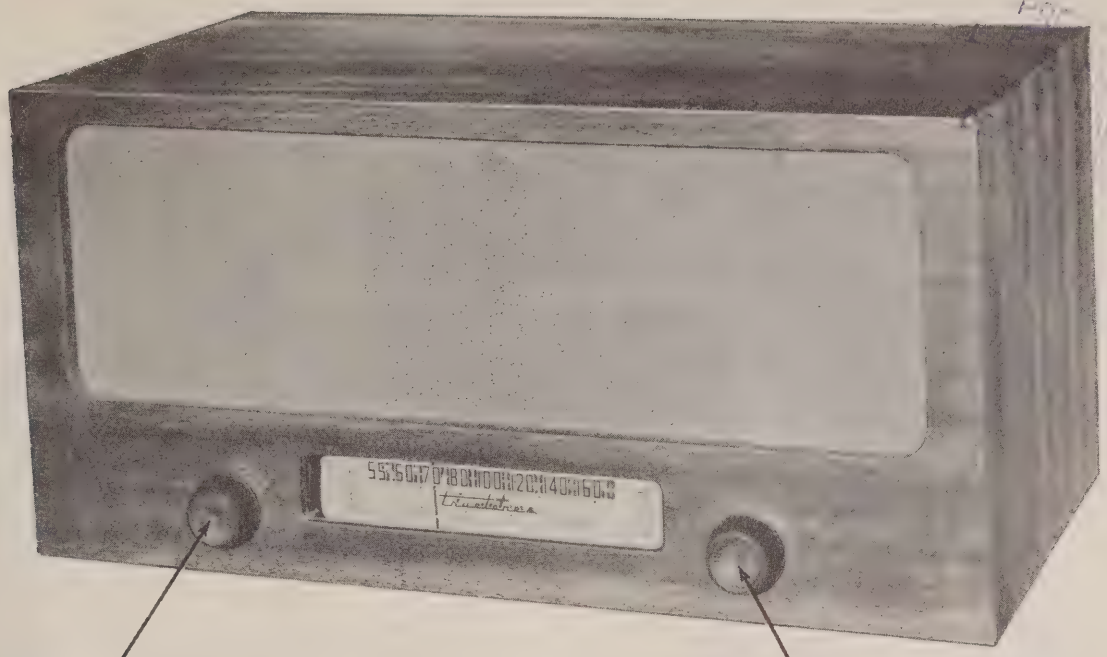
MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M4	RF Tuner	520645	Complete with Coils and Tubes
M5	Switch	520563	TV-Phono Selector (SPDT Slide)
M6	Ion Trap	509688	
B1	Trimmer	508071	10-160MMF (Horiz. Drive)
	Antenna Coil	520702	Channel 2
	Antenna Coil	520703	Channel 3
	Antenna Coil	520704	Channel 4
	Antenna Coil	520705	Channel 5
	Antenna Coil	520706	Channel 6
	Antenna Coil	520707	Channel 7
	Antenna Coil	520708	Channel 8
	Antenna Coil	520709	Channel 9
	Antenna Coil	520710	Channel 10
	Antenna Coil	520711	Channel 11
	Antenna Coil	520712	Channel 12
	Antenna Coil	520713	Channel 13
	RF, Mixer Grid & Osc. Coil	520722	Channel 2
	RF, Mixer Grid & Osc. Coil	520723	Channel 3
	RF, Mixer Grid & Osc. Coil	520724	Channel 4
	RF, Mixer Grid & Osc. Coil	520725	Channel 5
	RF, Mixer Grid & Osc. Coil	520726	Channel 6
	RF, Mixer Grid & Osc. Coil	520727	Channel 7
	RF, Mixer Grid & Osc. Coil	520728	Channel 8
	RF, Mixer Grid & Osc. Coil	520729	Channel 9
	RF, Mixer Grid & Osc. Coil	520730	Channel 10
	RF, Mixer Grid & Osc. Coil	520731	Channel 11
	RF, Mixer Grid & Osc. Coil	520732	Channel 12
	RF, Mixer Grid & Osc. Coil	520733	Channel 13
	Slug	507986	Osc. Coil (12 Used)
	Cabinet	520650-A	
	Cabinet Back	115238	
	Safety Glass	520476	
	Knob	509016	Channel Selector
	Knob	509017	Fine Tuning
	Knob	509018	Off/On Volume
	Knob	509019	Contrast
	Mask	520475-A	



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TRUETONE
MODEL D2263



TRUETONE
MODEL D2263

TRADE NAME	Truetone Model D2263
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	1.5 Volts "A" Supply & 90 Volts "B" Supply In Pack Form
RATING	250 MA ⓐ 1.5 Volts DC & 14 MA ⓐ 90 Volts DC
TUNING RANGE—BROADCAST	535-1625 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to last reference dot at low frequency end of dial back plate. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1U4 (V2). Low side to chassis.	455 KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum.
2.	"	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	"	"	"	A3, A4	"
3.	"	"	1625KC	"	"	A5	"
4.	200MMF	High side to antenna lead. Low side to chassis.	1400 KC	Tune to 1400 KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	4	150	18-273	PRS150/4		BR415		TC40	TVA-1402	
C2	.05	200	16-197	P288-05	DF-503	PJ2S5		PT415	2TM-S 5	
C3	47		15-229	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C4	.01	400	16-192	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C5	5000		16-177	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C6A	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322		
B	.002		17-104	BPD-002	DD-202	TM5D2	801-002	DC-522	34C3	
C	200			SI200	D6-201	TM5T2	GP2K-201	UC-532		
D	.005			BPD-005	DD-502	TM5D5	811-005	DC-525		
C7	.05	200	16-197	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	.002	600	16-198	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	A24-200				U-53	Volume
B	Shaft						DS-37	Attach to R1A
C	Switch						US-27	Attach to R1A

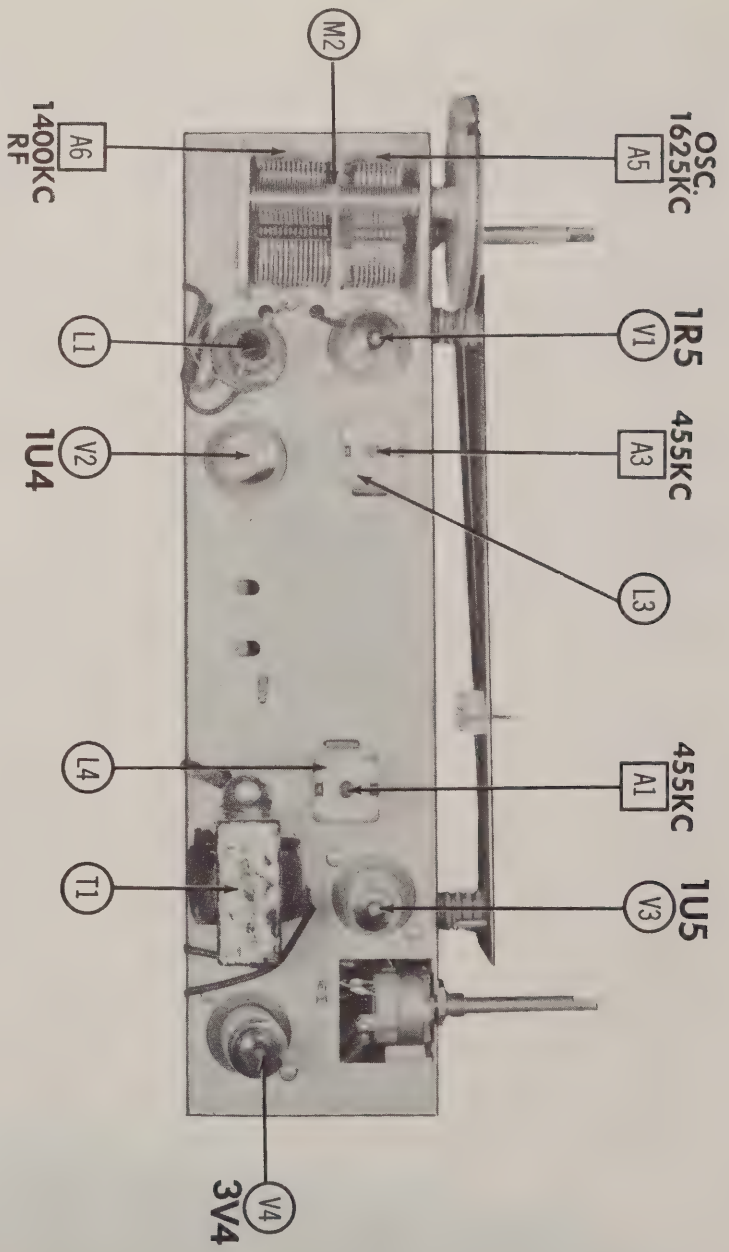
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R2	100KΩ	½	60-727	BTS-100K	
R3	10 Meg	½	60-728	BTS-10 Meg	
R4	10KΩ	½	60-764	BTS-10 K	
R5	2.2Meg	½	60-726	BTS-2.2Meg	
R6	47KΩ	½	60-730	BTS-47K	
R7	10 Meg	½	60-728	BTS-10 Meg	
R8	4.7Meg	½	60-779	BTS-4.7Meg	
R9	1 Meg	½	60-668	BTS-1 Meg	
R10	2.2Meg	½	60-726	BTS-2.2Meg	
R11	390Ω	½	60-665	BTS-390	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9.6KΩ	3.1Ω	498Ω	.59Ω	80-273	A-3879	A-2900	RO-16	S-11X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.1Ω	79-391	ST-105 Mod. P5-X	5J4	

COILS (RF-IF)

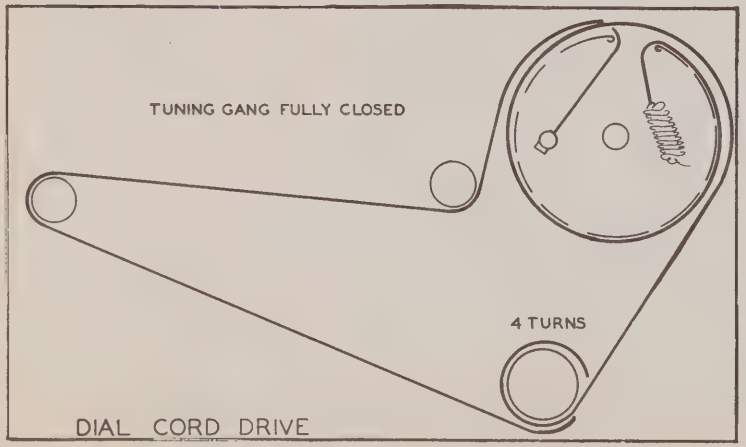
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRUETONE PART No.	MERIT PART No.	
L1	Ant. Coil	85Ω	7.2Ω	10-576		
L2	Osc. Coil	3.5Ω	8Ω	10-554		
L3	Input IF	20Ω	21Ω	10-508	BC-352	
L4	Output IF	20Ω	21Ω	10-508	BC-353	

BATTERIES

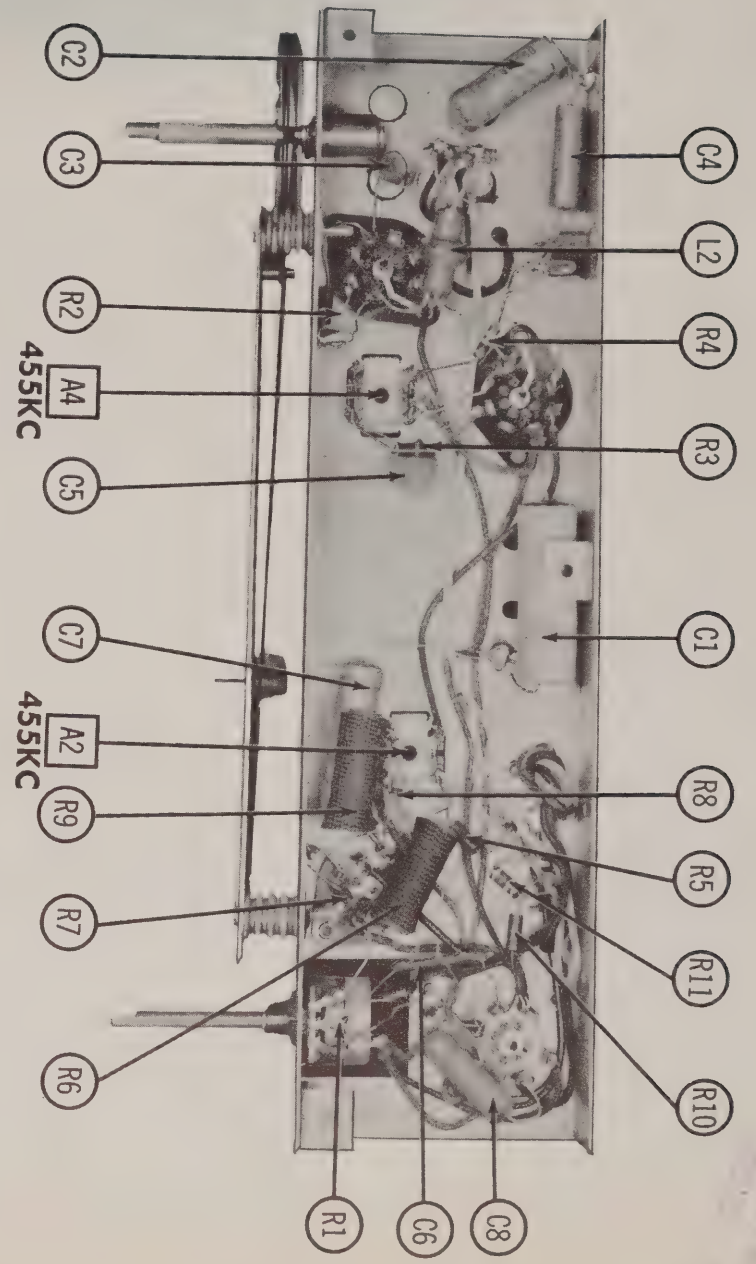
ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V "A"	Wizard 3B6432 or Wizard 3B6430			758			4SD60	
	90 V "B"								

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M2	Tuning Capacitor	19-220	35-475MMF, 36-202MMF
	Cabinet	42-527	Wood, Table
	Dial Glass	67-569	
	Dial Back Plate	31-200	
	Pointer	58-93	
	Knob	52-362	Volume Control
	Knob	52-370	Tuning Control

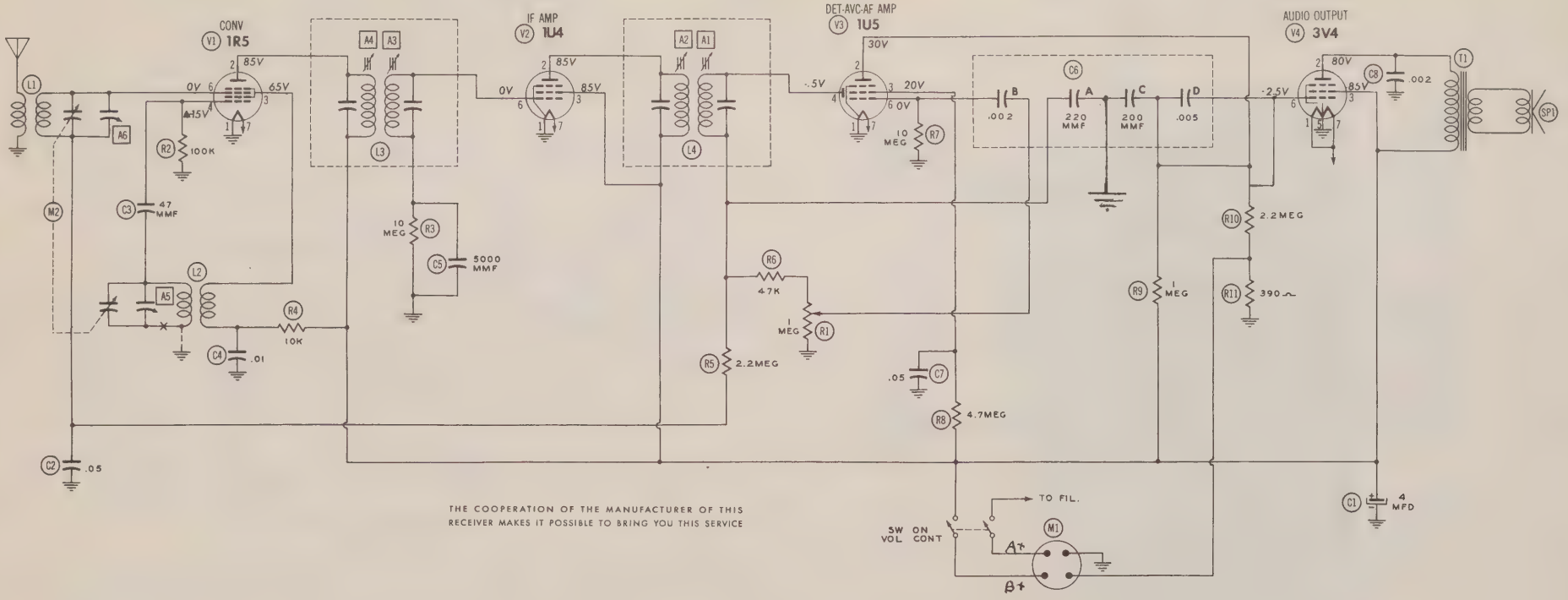


CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2263

TRUETONE MODEL D2263



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF=455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R4	0Ω	†20Ω	†10KΩ	100KΩ	INF	3.2Meg	*
V 2	1U4	0Ω	†20Ω	†0Ω	INF	0Ω	10 Meg	*
V 3	1U5	0Ω	†1 Meg	†4.7Meg	1.1Meg	INF	10 Meg	*
V 4	3V4	*	†498Ω	1Meg	INF	0Ω	2.2Meg	*

† MEASURED FROM PIN 3 OV V4
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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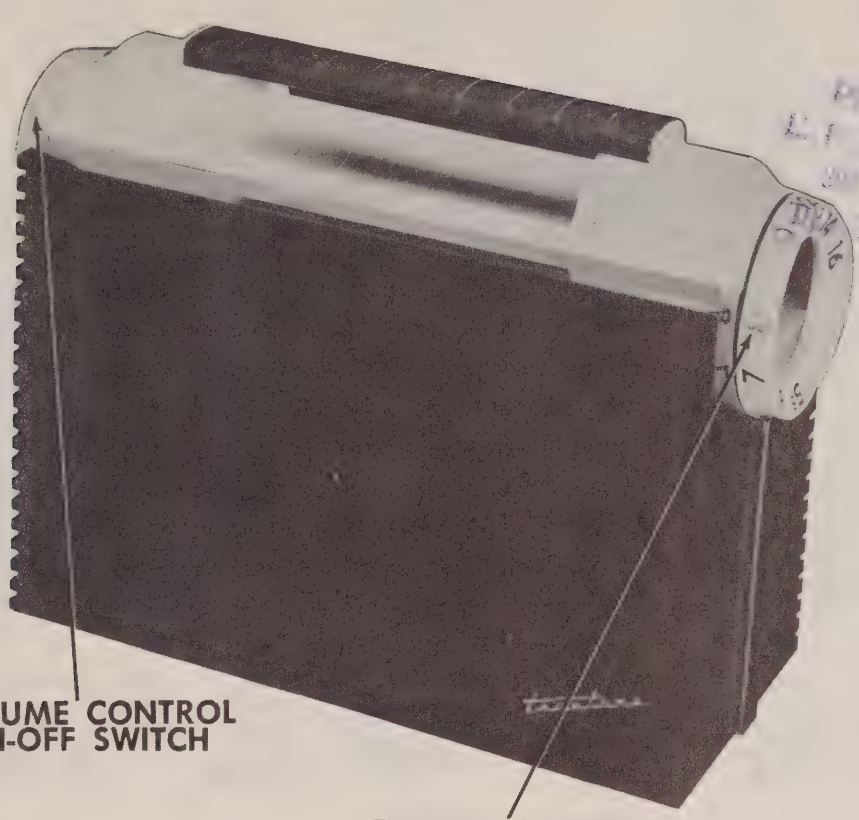
1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum no signal applied for voltage measurements.

TRUETONE
MODEL D3210A



PROPERTY
L. F. DUNKEL
...READE
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TRUETONE
MODEL D3210A

TRADE NAME	Truetone Model D3210A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC (or) 7½ Volt "A" Supply & 90 Volt "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 50 MA @ 7.5 Volts DC & 14MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455 KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1620 KC	"	"	A5	"
3.		Loop	1400 KC	Tune to 1400 KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

To set pointer turn tuning gang fully closed and replace tuning knob with mark at low frequency end of dial opposite index mark on receiver case.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D3210A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	8C-16068							
B	■40	150								
C	▲50	25								
D	200	10								
C2	220		8G-14459	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C3	.05	200	8D-14460	P285-05	DF-503	PJ2S5			68P16	
C4	.02	200	8D-17268	P285-02	DF-203	PJ2S2			68P15	
C5	.02	200	8D-17268	P285-02	DF-203	PJ2S2			68P15	
C6	.25	100	8D-18042	P185-25		MTM2P25			68P19	
C7A	100		†201-15005	SI100	†PC-50	TM5T1	†1403-01	UC-531	†100C1	
B	100			SI100		TM5T1		UC-531		
C8	5000		8D-17785	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C9A	50			SI50		TM5Q5		UC-545	5GA-Q5	
B	5000		♦201-19996	BPD-005	♦PC-90	TM5D2	♦1407-01	DC-525	5HK-D5	
C	2000			BPD-002		TM5D2		DC-522	5HK-D2	
C10	.005	200	8G-13962	P285-005	D6-502	ZNW2D5	GP2-333-502	MT615	68P11	
C11	.047	400	8J-16081	489ZGXY-05		PJ4S5		PT4147	4TM-S47	
C12	.09	400	8D-11251	P488-1		PTE4P1		PT401	4TM-P1	

† Items C7A, C7B, R11 are combined in one unit.
♦ Items C9A, C9B, C9C, R13A, R13B, R13C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	A10A19596	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume-Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

Note 1. Some models use alternate control (Part No. 10A-19596-1).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	IRC PART No.	NOTES
R2	3.3Meg	½	9B1-104	BTS-3.3Meg	
R3	3.3Meg	½	9B1-104	BTS-3.3Meg	
R4	100KΩ	½	9B1-86	BTS-100K	
R5	22KΩ	½	9B1-78	BTS-22K	
R6	3.3Meg	½	9B1-104	BTS-3.3Meg	
R7	6.8Meg	½	9B1-108	BTS-6.8Meg	
R8	680Ω	½	9B1-155	BTS-680	
R9	680Ω	½	9B1-155	BTS-680	
R10	560KΩ	½	C-9B1-95	BTS-560K	Note 1
R11	47KΩ	½	†201-15005	BTS-47K	

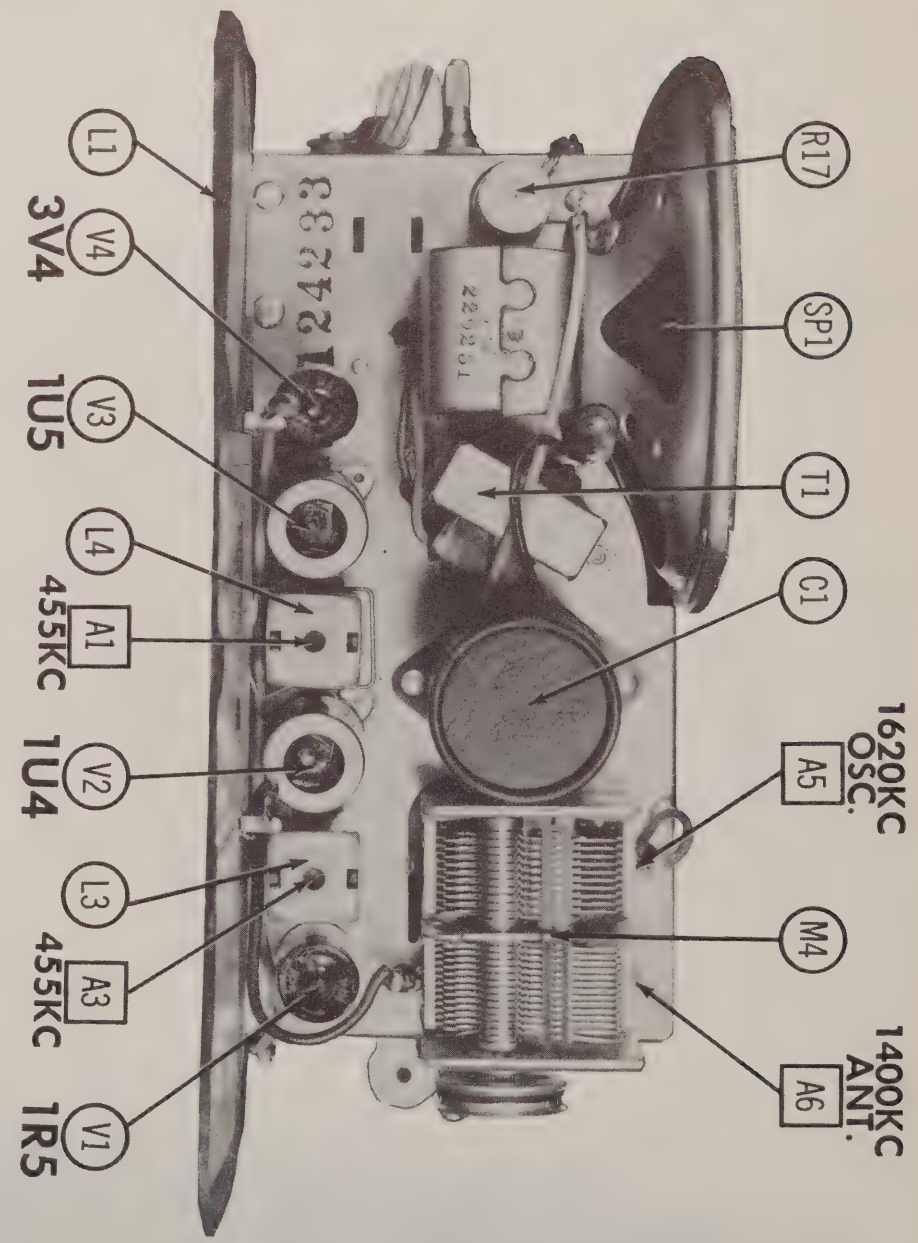
ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	IRC PART No.	NOTES
R12	10 Meg	½	9B1-37	BTS-10 Meg	
R13A	4.7Meg	½	♦ 201-19996	BTS-4.7Meg	
B	1 Meg	½		BTS-1 Meg	
C	2.2Meg	½		BTS-2.2Meg	
R14	1000Ω	½	9B1-159	BTS-1000	
R15	30Ω	2	9C-19770		
R16	2700Ω	1	9B2-169	BTA-2700	
R17	2650	10	9M-19833		Note 2
R18	220KΩ	½	C9B1-90	BTS-220K	

† Items R11, C7A, C7B, are combined in one unit.
♦ Items R13A, R13B, R13C, C9A, C9B, C9C are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models use a 2800Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	8.2KΩ	3.3Ω	472Ω	.42Ω	12C19591	A3329	A-2927 ①	RO-301 ①	S-8X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	18A19586	ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRUETONE PART No.	MERIT PART No.	
L1	Loop Ant.	3.2Ω		13E-19844		
L2	Osc. Coil	2Ω	5.7Ω	13D-19595		
L3	Input IF	20Ω	20Ω	13B-17397	BC-352	
L4	Output IF	20Ω	20Ω	13B-17397	BC-353	

SELENIUM RECTIFIER

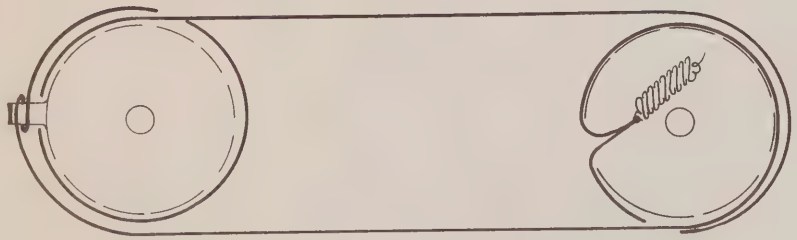
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	TRUETONE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.060A	21J19615	NA5	8J1	1002A	6S65	

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A"	Wizard #3B6160	717			C5			
M3	90 V "B"	Wizard #3B6260		490			N60		

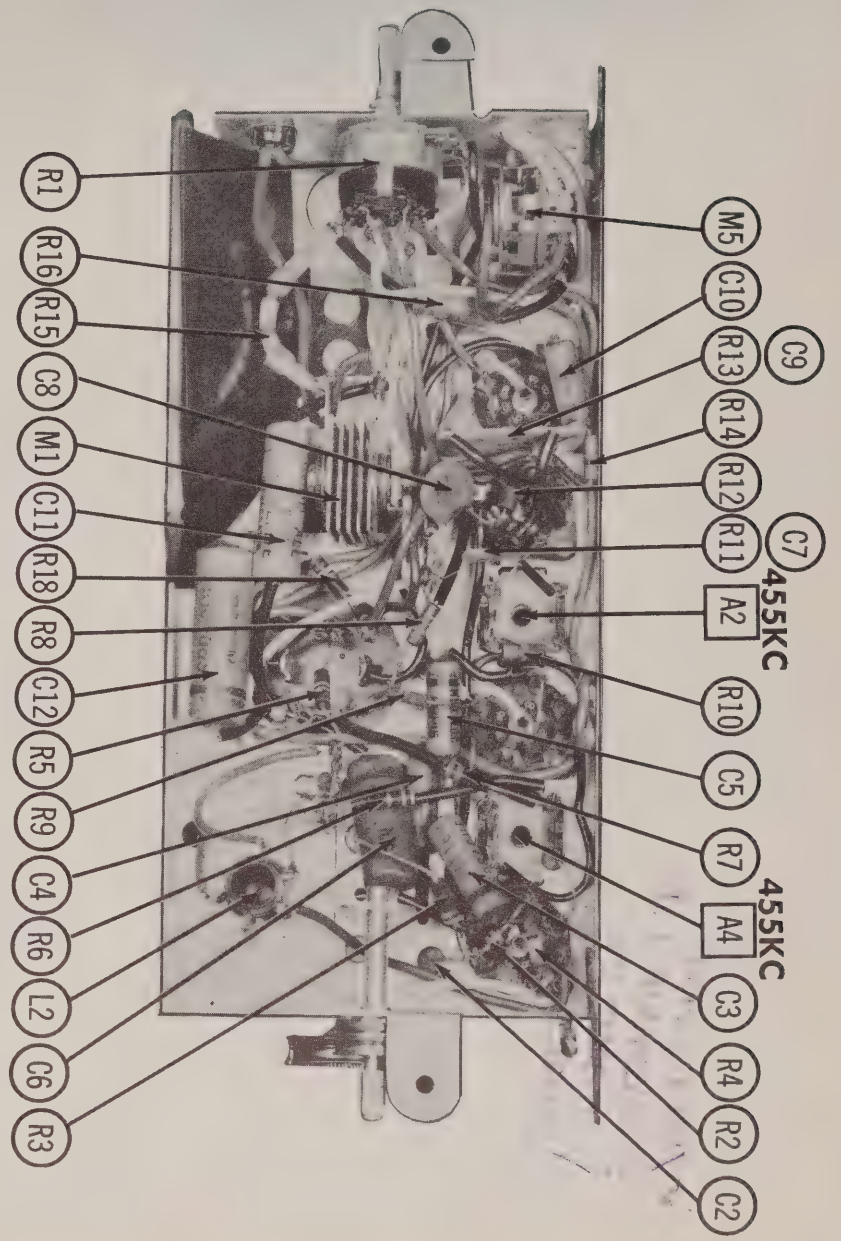
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuning Capacitor	8A-21093	66-480MMF, 22-158MMF
M5	Switch	20A-19588	AC-DC Battery, 3PDT
	Cabinet	5C-19576-96	
	Escutcheon	5C-21007-95	
	Handle	23A-20993-96	
	Knob	5B-21008-95	Tuning
	Knob	5B-21009-95	Off-On Volume



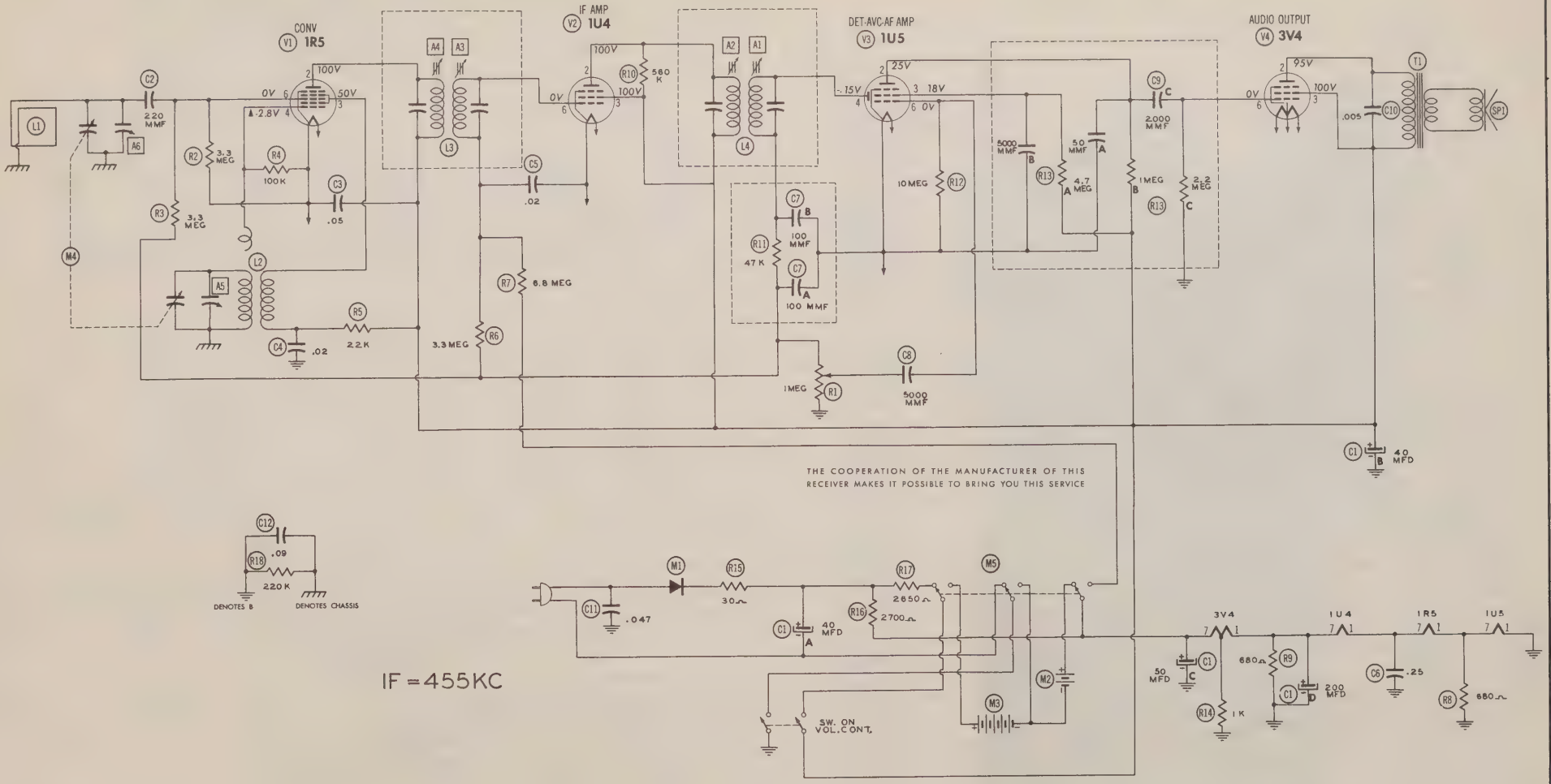
DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D321OA

TRUETONE MODEL D321OA



IF = 455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.7KΩ	†25KΩ	100KΩ	*	1.9Meg	*
V 2	1U4	*	†2.7KΩ	†2.7KΩ	*	*	2.6Meg	*
V 3	1U5	*	†1 Meg	†4.7Meg	1 Meg	*	10 Meg	*
V 4	3V4	*	†3.2KΩ	†2.7KΩ	INF	*	2.2Meg	*

MEASUREMENTS TAKEN IN "AC-DC" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

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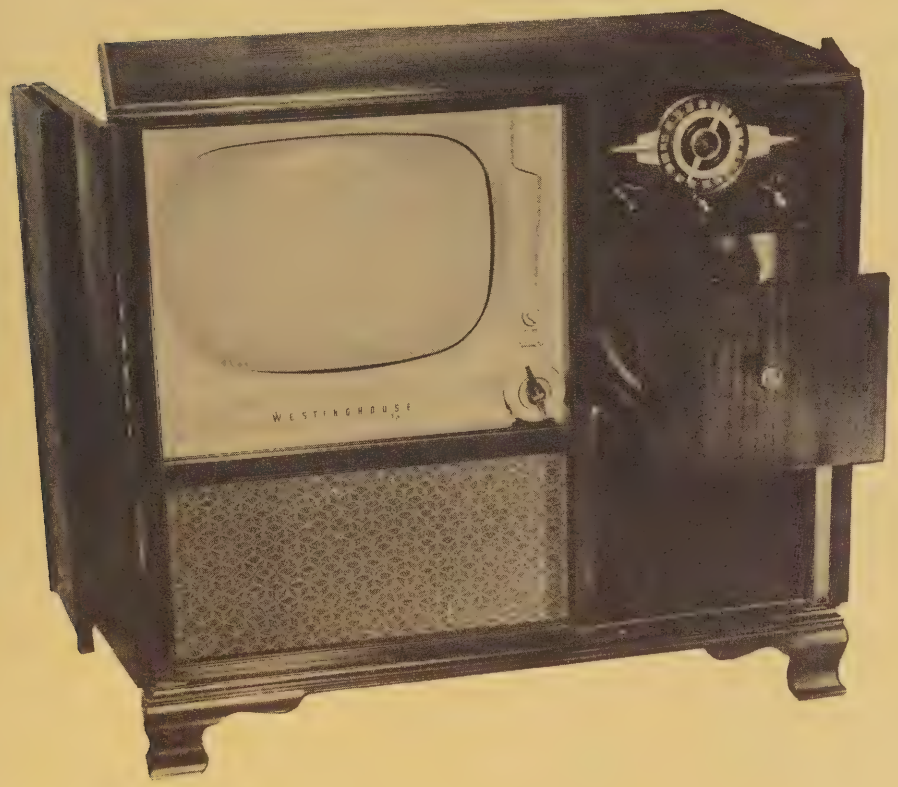

MODEL H-730C21

WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

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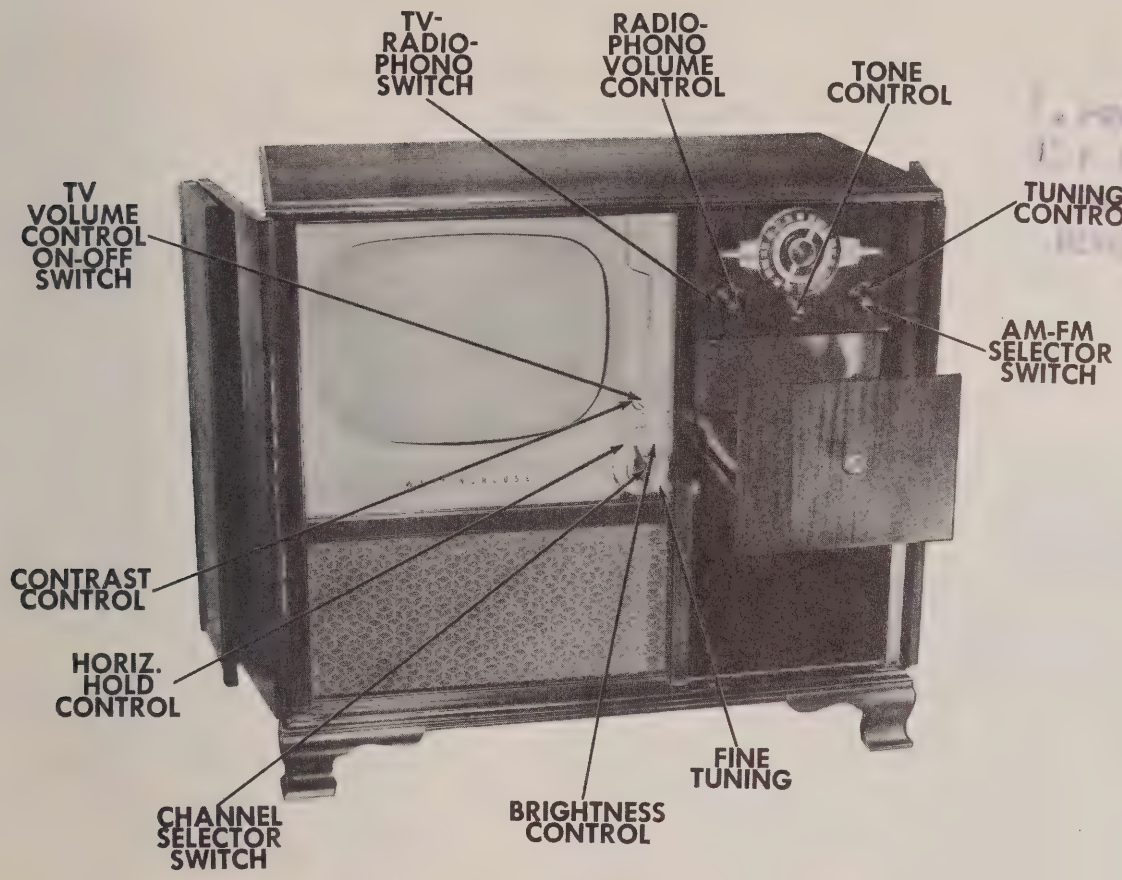
*TRADE MARK

WESTINGHOUSE MODELS
H-730C21, H-732C21, H-733C21
(Ch. V-2218-1 & Radio Ch. V-2180-9, -10)



WESTINGHOUSE MODEL H-730C21

TRADE NAME	Westinghouse Models, H-730C21 (TV Ch. V-2218-1, Radio Ch. V-2180-9), H-732C21, H-733C21 (TV Ch. 2218-1, Radio Ch. V-2180-10)
MANUFACTURER	Westinghouse Electric Corp., Television-Radio Div., Sunbury, Pa.
TYPE SET	TV-FM-AM-Phono Combination Receiver
TUBES	Twenty Nine
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.86 Amp. @ 117 Volts AC
TUNING RANGE	TV Channels 2 thru 13, FM 88-108MC, AM 540-1600KC

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FOR SERVICE INFORMATION ON RECORD CHANGER SEE V-M MODEL 950, PHOTOFACT SET 107, FOLDER 13, OR RECORD CHANGER MANUAL CM-3. ALSO, SEE SUPPLEMENT DATA PHOTOFACT SET 131 FOLDER 17.

WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

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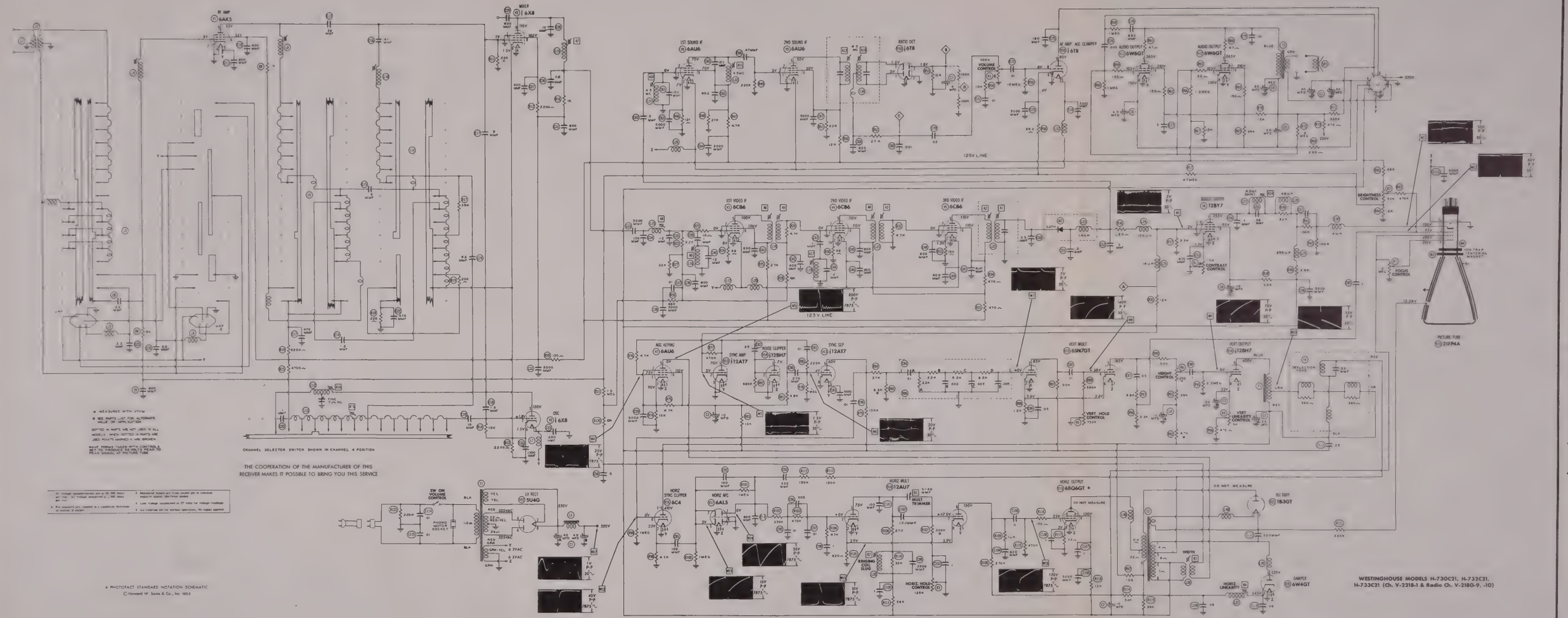
RF AMP V1 6AK5
MIXER V2 6X8
1ST SOUND IF V3 6AU6
2ND SOUND IF V4 6AU6
RATIO DET V5 6T8
AF AMP AGC CLAMPER V6 6T8
AUDIO OUTPUT V7 6W6GT
AUDIO OUTPUT V8 6W6GT
1ST VIDEO IF V9 6CB6
2ND VIDEO IF V10 6CB6
3RD VIDEO IF V11 6CB6
VIDEO DET V12 6AL5
1ST VIDEO AMP V13 12BY7
AGC KEYING V14 6AU6
SYNC AMP V15 12AT7
NOISE CLIPPER V16 12BH7
SYNC SEP V17 12AT7
VERT MULT V18 6SN7GT
VERT OUTPUT V19 12BH7
HORIZ SYNC CLIPPER V20 6C4
HORIZ AFC V21 6AL5
HORIZ MULT V22 12AU7
HORIZ OUTPUT V23 6BQ6GT
DAMPER V24 6W4GT
HV RECT V25 5U4G
OSC V26 6X8
PICTURE TUBE V27 21FP4A
125V LINE
CONTRAST CONTROL
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP PATENTED MAGNET
VOLUME CONTROL
FINE TUN ING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 4 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SW ON VOLUME CONTROL
PHONO MOTOR SOCKET
HEIGHT CONTROL
VERT HOLD CONTROL
VERT LINEARITY CONTROL
DEFLECTION YOKE
HORIZ HOLD CONTROL
BINDING CLIP SLIDE
MULT TRIMMER
WIDTH
HORIZ LINEARITY
DO NOT MEASURE
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WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

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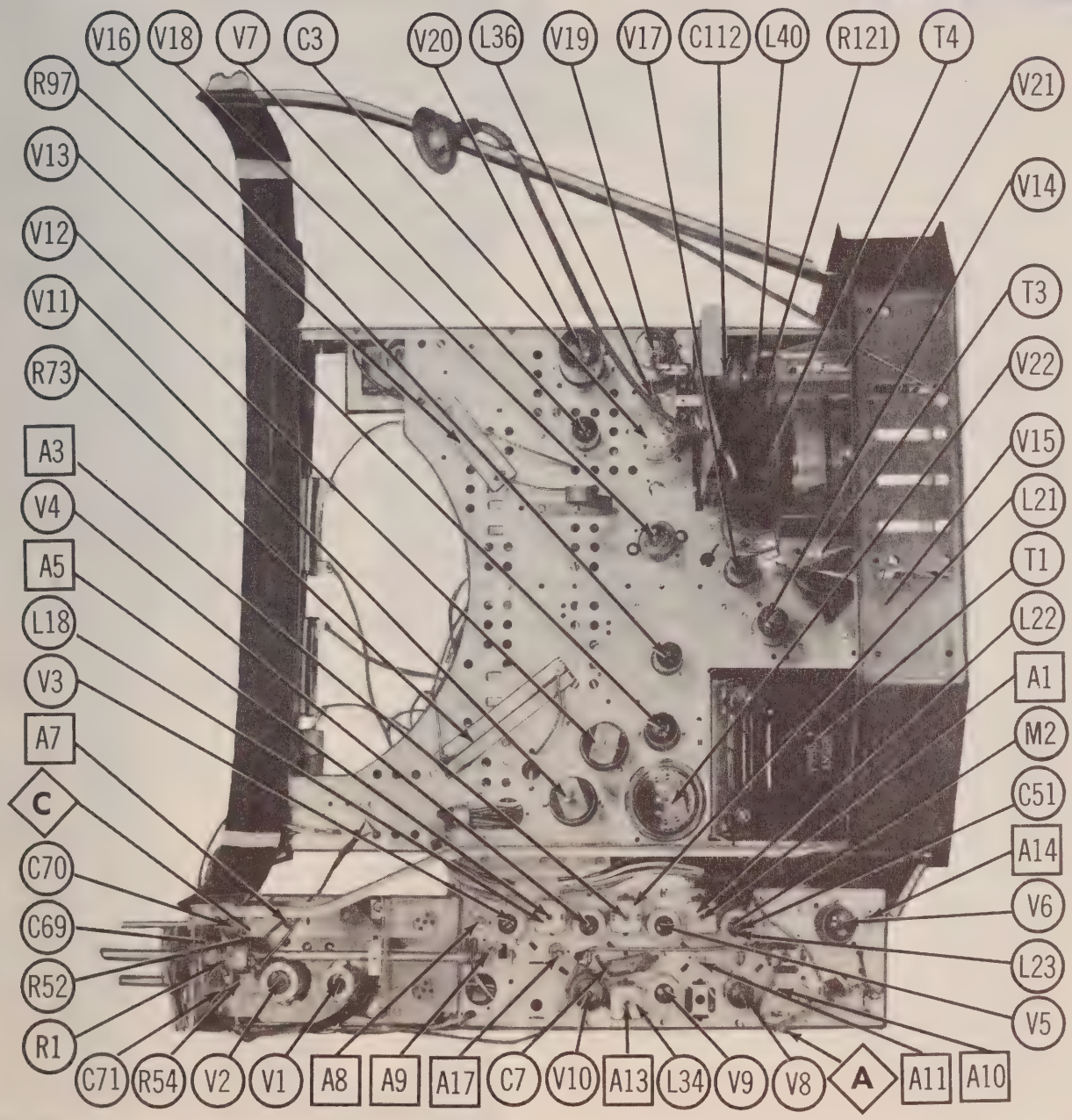
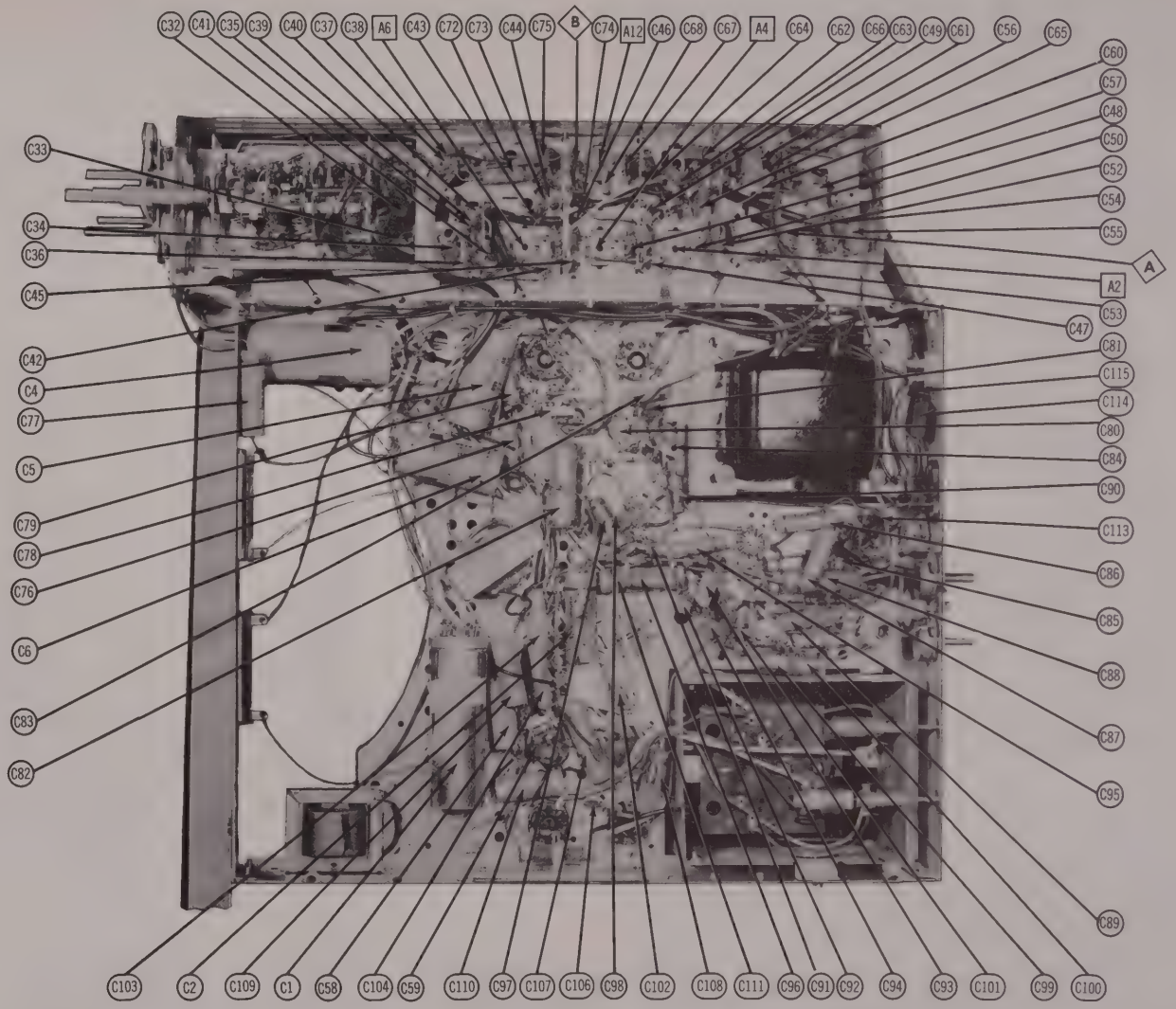
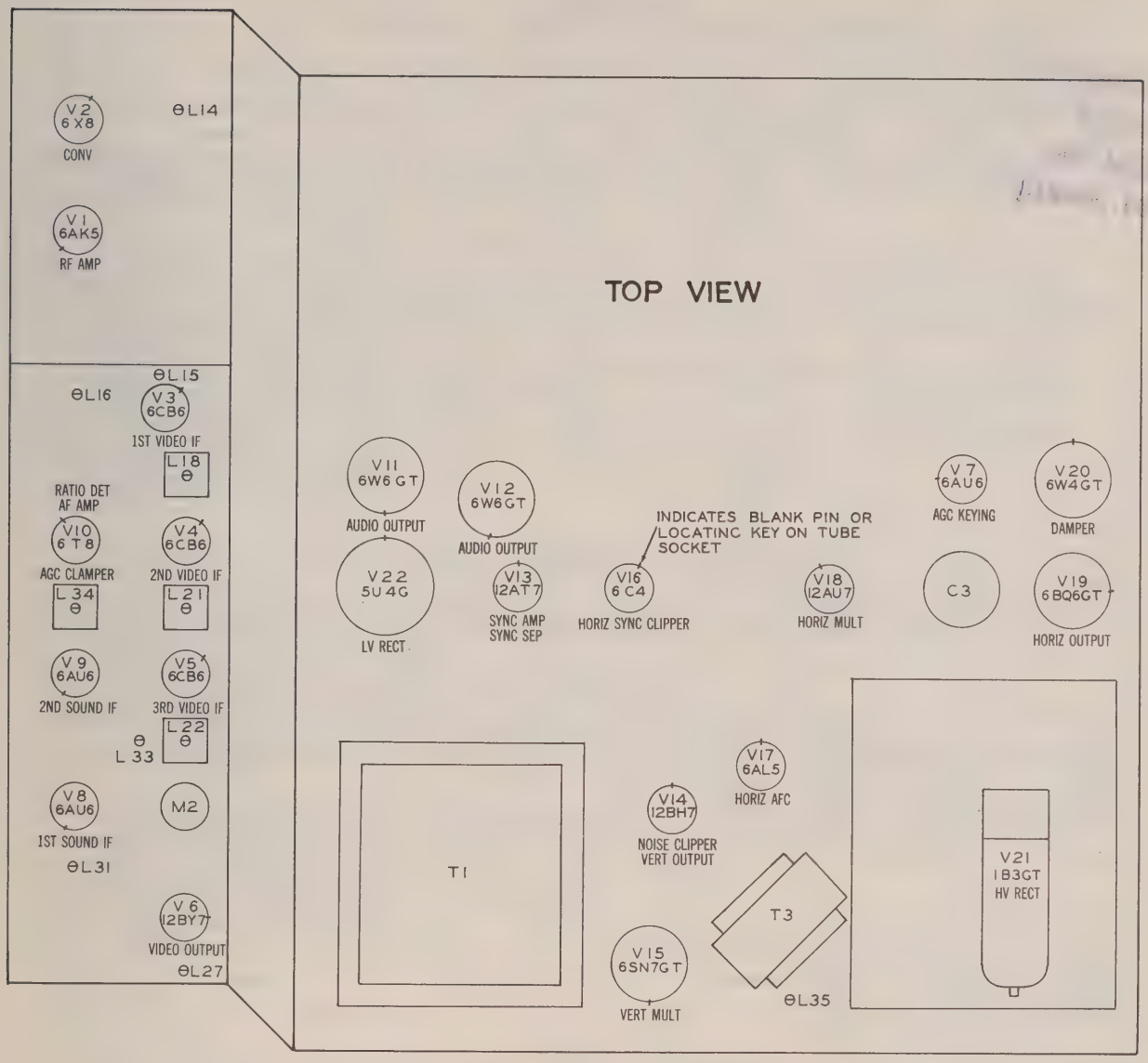


T V. CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22

LOSS OF PICTURE OR SOUND
No pic, No sound, has raster - V2, V3, V4, V5, V11, V12
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V23
Has pic, no sound - V8, V9, V10, V11, V12
Overloaded picture - V7, V10

SYNC FAILURE
No vert. sync - V13, V15
No horiz. sync - V13, V16, V17, V18
No vert. or horiz. sync - V13

SWEEP FAILURE
No raster, has ound - V18, V19, V20, V21, V23
No vertical deflection - V14
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V13, V15
Horiz. off freq. - V13, V16, V17, V18

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the 6AK5 RF Tube from its socket to eliminate it as a possible source of interference during alignment.
Connect the negative lead of a 9 volt bias supply to the AGC terminal at top rear of chassis.
Connect the positive lead to chassis.
When connecting the sweep generator to the various stages of the video IF strip make the ground connection to chassis as close as possible to grounding point for that stage.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp)	42.25MC 43MC 44MC 45MC 45.75MC	13	Vert. amp thru net - word as in fig. 1. to point (A) Low side to chassis.	A1, A2	Detune plate curcuit of V4 by clipping an alligator clip to pin 5 of V4. CAUTION B+ . Adjust for c urve of maximum height and symmetry as in fig. 2.
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A3, A4	More the alligator clip to pin 5 of V3. Adjust for curve of maximum height and symmetey as in fig. 3.
3.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	"	"	"	"	A5, A6	Remove alligator clip from pin 5 of V3. Adjust for curve of maximum height and symmetry as in fig. 4.
4.	"	High side to an ungrounded tube shield floating over converter tube.(V2) Low side to chassis.	"	44MC	"	"	A7, A8	Preset A9 completely clocksise. Adjust A7 for maximum response. Adjust A8 for symmetrical top to response. 44MC should be at center of flat-top response curve.
5.	"	"	"	41.25MC 42.25MC 43MC 44MC 45MC 45.75MC	"	"	A9	Adjust for MINIMUM response at 41.25MC. Check for response as in fig. 5. If necessary readjust A7 and A8 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	13	DC probe to point (B) Common to chassis.	A10, A11, A12	Adjust for maximum deflection. Attenuate generator to maintain less than 5 volts at VTVM.
7.	"	"	"	"	DC probe to point (C) Common to point (D)	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	13	Vert. amp to point (B) Low side to chassis.	A10, A11, A12	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in fig. 6.
7.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A13	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in fig.7 SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod.)	13	DC probe thru detector (fig. 8) to pin 11 of picture tube.	A14	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Replace the 6AK5 RF tube in its socket. Remove bias battery if not removed previously. Tune in TV station operating on highest low band channel in vicinity. Set fine tuning control at center of range (set screw on fine tuning drive wheel will be straight up).
Adjust A15 for best picture detail.
Switch to highest high band TV station operating in the vicinity. Adjust A16 for best picture detail. Check low band station and readjust A15 slightly, if necessary.

ADJACENT CHANNEL 47.25MC TRAP

If adjacent channel interference is not experienced in the receiving area A17 should be adjusted to its maximum counter clockwise rotation.
In case of interference tune the set to the channel where interference is noted and starting at maximum counter clockwise position adjust A17 clockwise until interference is eliminated. In some cases this adjustment may affect the video IF alignment making it necessary to repeat step 3.

RF ALIGNMENT

The RF portion of this receiver has been correctly aligned at the factory and is very stable.
Alignment of this portion should not be required in the field.

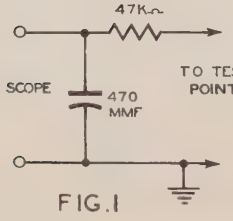


FIG.1

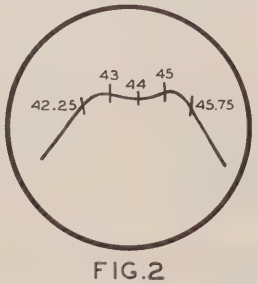


FIG.2

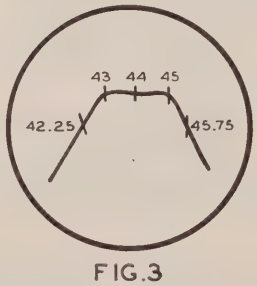


FIG.3

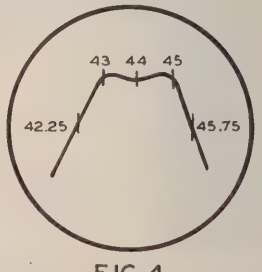


FIG.4

TV ALIGNMENT INSTRUCTIONS (CONT.)

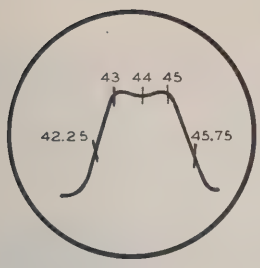


FIG.5

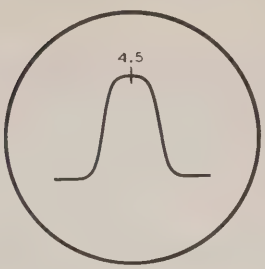


FIG.6

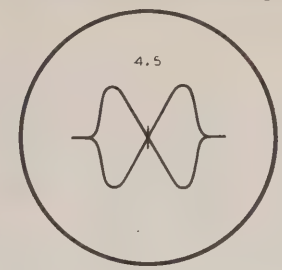


FIG.7

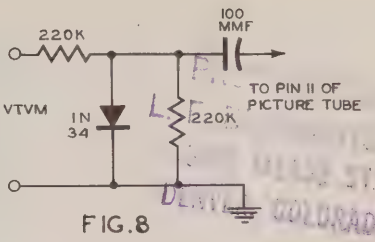


FIG.8

RADIO ALIGNMENT INSTRUCTIONS

AM ALIGNMENT

Turn Phono-TV-Radio switch to Radio.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.1MFD	High side to stator plates of rear section of tuning gang. Low side to chassis.	455KC (400% Mod)	AM	Tuning gang fully open.	Across voice coil.	A18, A19, A20, A21	Adjust for maximum output.
10.		Loop	1615-C	"	"	"	A22	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
11.		"	1400KC	"	Tune to 1400KC signal.	"	A23	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point ◇E◇ to chassis. The junction of these two resistors is alignment point ◇G◇ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	.1MFD	High side to pin 2 (grid) of 12AT7 (V25A). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point ◇E◇. Common to chassis.	A24, A25 A26, A27, A28	Adjust for maximum deflection.
13.	"	"	"	"	"	DC probe to point ◇F◇. Common to point ◇G◇.	A29	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
12.	.1MFD	High side to pin 2 (grid) of 12AT7 (V25A). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully open.	Vert. amp to point ◇E◇ Low side to chassis.	A24, A25, A26, A27, A28	Disconnect stabilizer capacitor C116. Adjust for curve of maximum amplitude and symmetry as in fig. 9.
13.	"	"	"	"	"	Vert. amp to point ◇F◇ Low side to chassis.	A29	Reconnect capacitor C116. Adjust so that 10.7MC occurs at center of crossover lines as in fig. 10. SLIGHTLY retouch A28 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
14.	270Ω Carbon Resistors	High side thru 270Ω to ungrounded FM antenna terminal. Low side to chassis.	98MC (Unmod.)	FM	98MC	DC probe to point ◇E◇. Common to chassis.	A30, A31	Adjust in order given for maximum deflection.
15.	"	"	105MC	"	Tune to 105MC signal	"	A32	Adjust for maximum deflection.
16.	"	"	90MC	"	Tune to 90MC signal	"	A31	Adjust for maximum deflection while rocking tuning gang. Repeat steps 15 and 16 for optimum tracking.

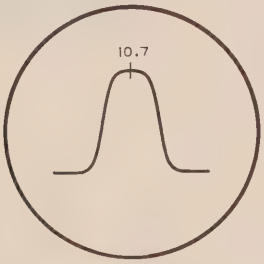


FIG. 9

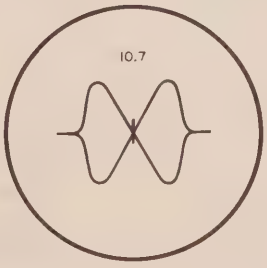
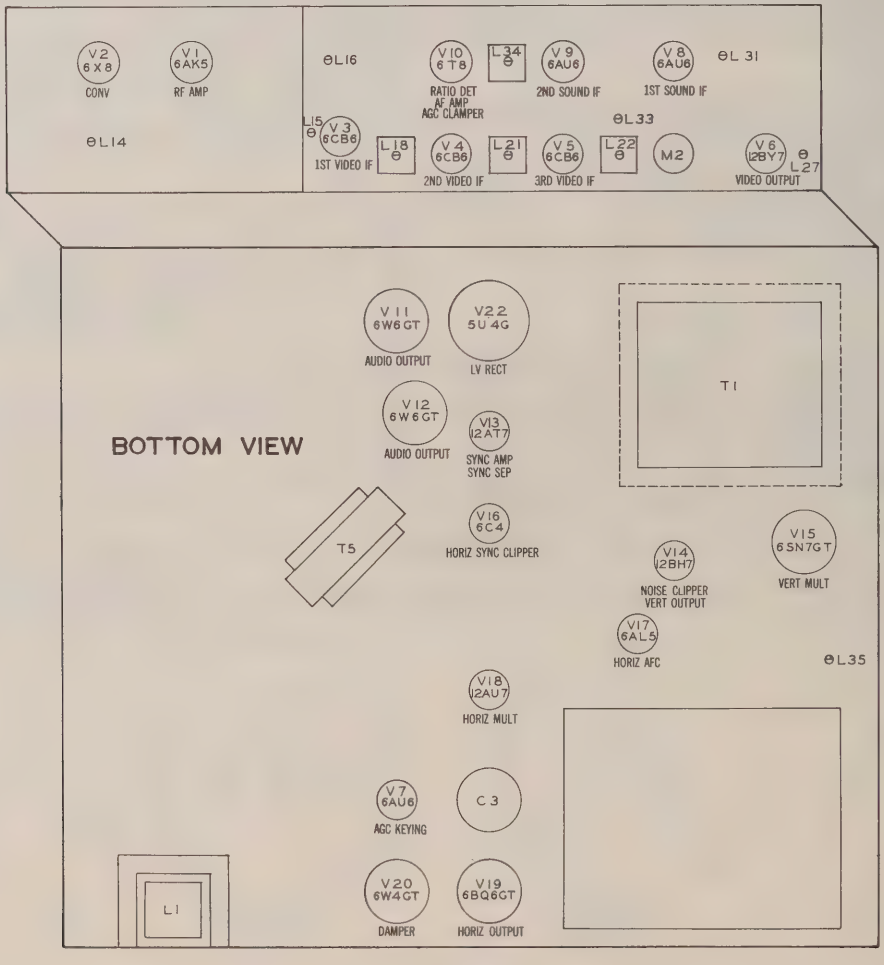


FIG. 10

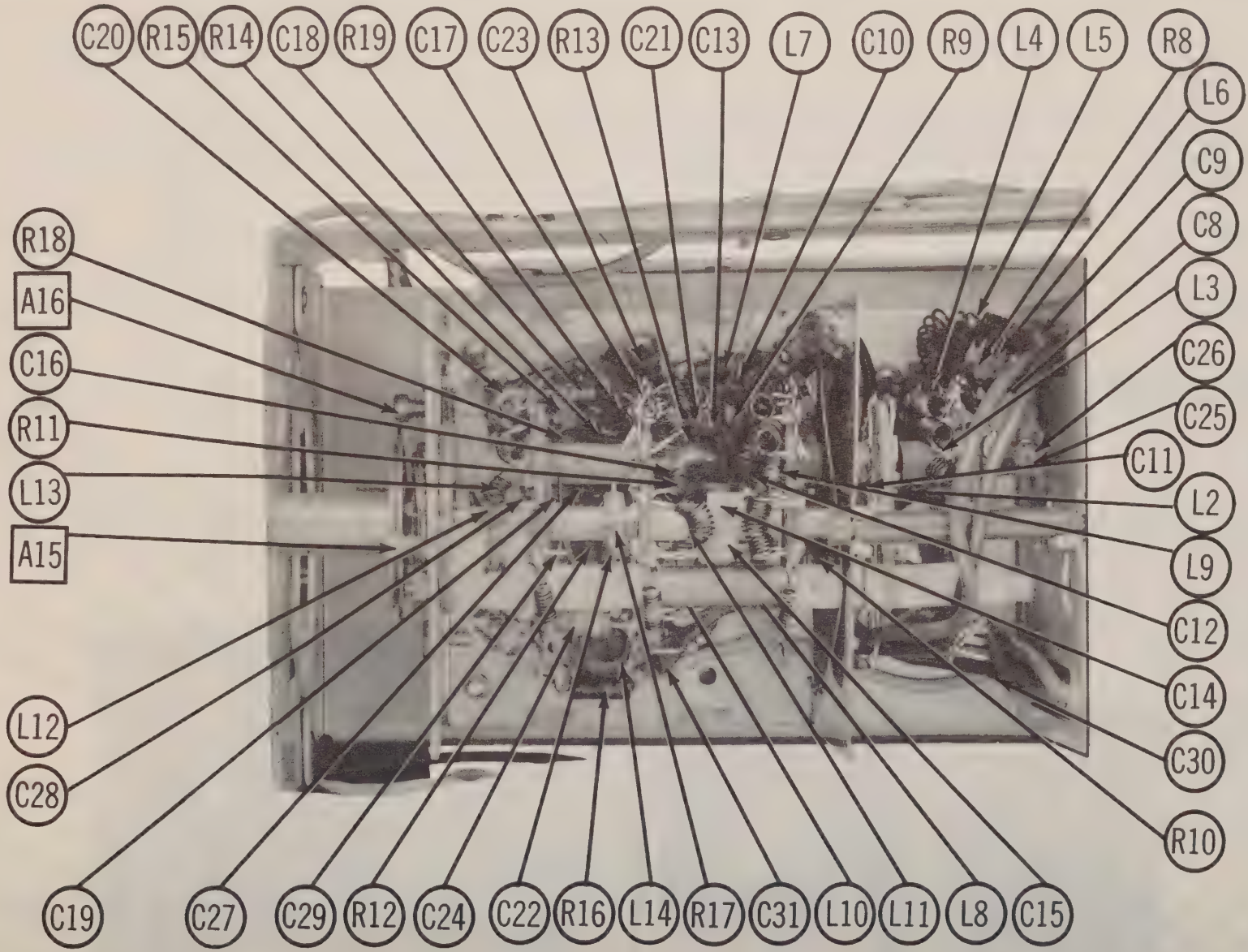
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AK5	1.6Meg	0Ω	.1Ω	0Ω	■8.4KΩ	■9.4KΩ	0Ω		
V 2	6X8	0Ω	17KΩ	■5KΩ	0Ω	.1Ω	2.2KΩ	220KΩ	■2.5KΩ	■635KΩ
V 3	6CB6	35KΩ	68KΩ	.1Ω	0Ω	■2.9KΩ	■2.9KΩ	0Ω		
V 4	6CB6	43KΩ	68KΩ	.1Ω	0Ω	■670Ω	■670Ω	0Ω		
V 5	6CB6	0Ω	150Ω	.1Ω	0Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 6	12BY7	82Ω	3.3KΩ	0Ω	.1Ω	.1Ω	0Ω	†3.9KΩ	†100KΩ	0Ω
V 7	6AU6	25KΩ	10.3KΩ	.1Ω	0Ω	100KΩ	†11KΩ	10.3KΩ		
V 8	6AU6	0Ω	0Ω	.1Ω	0Ω	■4.9KΩ	■4.9KΩ	120Ω		
V 9	6AU6	220KΩ	0Ω	.1Ω	0Ω	■12KΩ	■12KΩ	0Ω		
V 10	6T8	INF	12KΩ	INF	0Ω	.1Ω	1.6Meg	0Ω	10Meg	†330KΩ
V 11	6W6GT	INF	0Ω	†750Ω	†11KΩ	400KΩ	†385KΩ	.1Ω	6.7KΩ	
V 12	6W6GT	INF	0Ω	†750Ω	†11KΩ	400KΩ	†385KΩ	.1Ω	6.7KΩ	
V 13	12AT7	†20KΩ	15KΩ	0Ω	.1Ω	.1Ω	28KΩ	1 Meg	0Ω	0Ω
V 14	12BH7	680KΩ	680KΩ	0Ω	.1Ω	.1Ω	#11KΩ	2.2Meg	2.8KΩ	0Ω
V 15	6SN7GT	60KΩ	†100KΩ	1.2KΩ	780KΩ	#440KΩ	1.2KΩ	.1Ω	0Ω	
V 16	6C4	#10KΩ	INF	0Ω	.1Ω	#10KΩ	1 Meg	4.7KΩ		
V 17	6AL5	1 Meg	0Ω	0Ω	.1Ω	1 Meg	0Ω	2 Meg		
V 18	12AU7	†83KΩ	2.7Meg	820Ω	.1Ω	.1Ω	#300KΩ	420KΩ	820Ω	0Ω
V 19	6BQ6GT	INF	0Ω	INF	†12KΩ	470KΩ	INF	.1Ω	33Ω	Top Cap #50Ω
V 20	6W4GT	INF	INF	50KΩ	INF	†52Ω	INF	0Ω	.1Ω	
V 21	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #560Ω
V 22	5U4G	INF	14.2KΩ	INF	22Ω	INF	26Ω	INF	14.2KΩ	
V 23	21FP4A	0Ω	500KΩ	Pin 6 450KΩ	Pin 10 #33KΩ	Pin 11 55KΩ	Pin 12 .1Ω			

† MEASURED FROM PIN 8 OF V22
# MEASURED FROM PIN 3 OF V20
■ MEASURED FROM PIN 8 OF V11

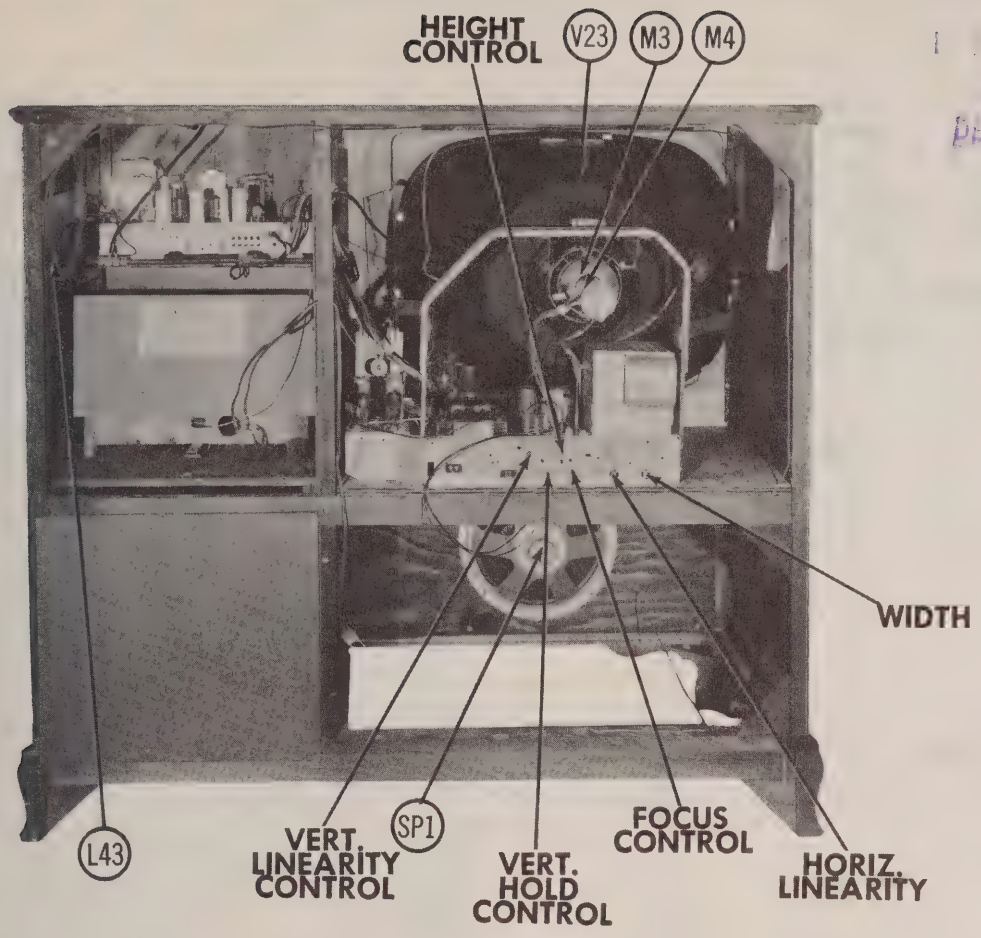


TUBE PLACEMENT CHART


C20
R15
R14
C18
R19
C17
C23
R13
C21
C13
L7
C10
R9
L4
L5
R8
L6
C9
C8
L3
C26
C25
C11
L2
L9
C12
C14
C30
R10
R18
A16
C16
R11
L13
A15
L12
C28
C19
C27
C29
R12
C24
C22
R16
L14
R17
C31
L10
L11
L8
C15

RF TUNER

DENVER, COLORADO



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to the center of its range.

Short out the ringing coil, L3 with a short wire jumper.

Connect a VTVM to the junction of C98 and R104. Connect the common lead of VTVM to chassis.

Adjust multivibrator trimmer (B1) for zero voltage at the VTVM. If zero voltage can be approached but not reached it may be necessary to set the horizontal hold control slightly to one side of center to obtain zero voltage.

Remove the jumper from L3 and adjust the ringing coil slug (B2) for zero voltage on the VTVM.

Remove VTVM. Check sync pull in by switching momentarily to another channel and back. Picture should fall into sync immediately.

Adjust the width control slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

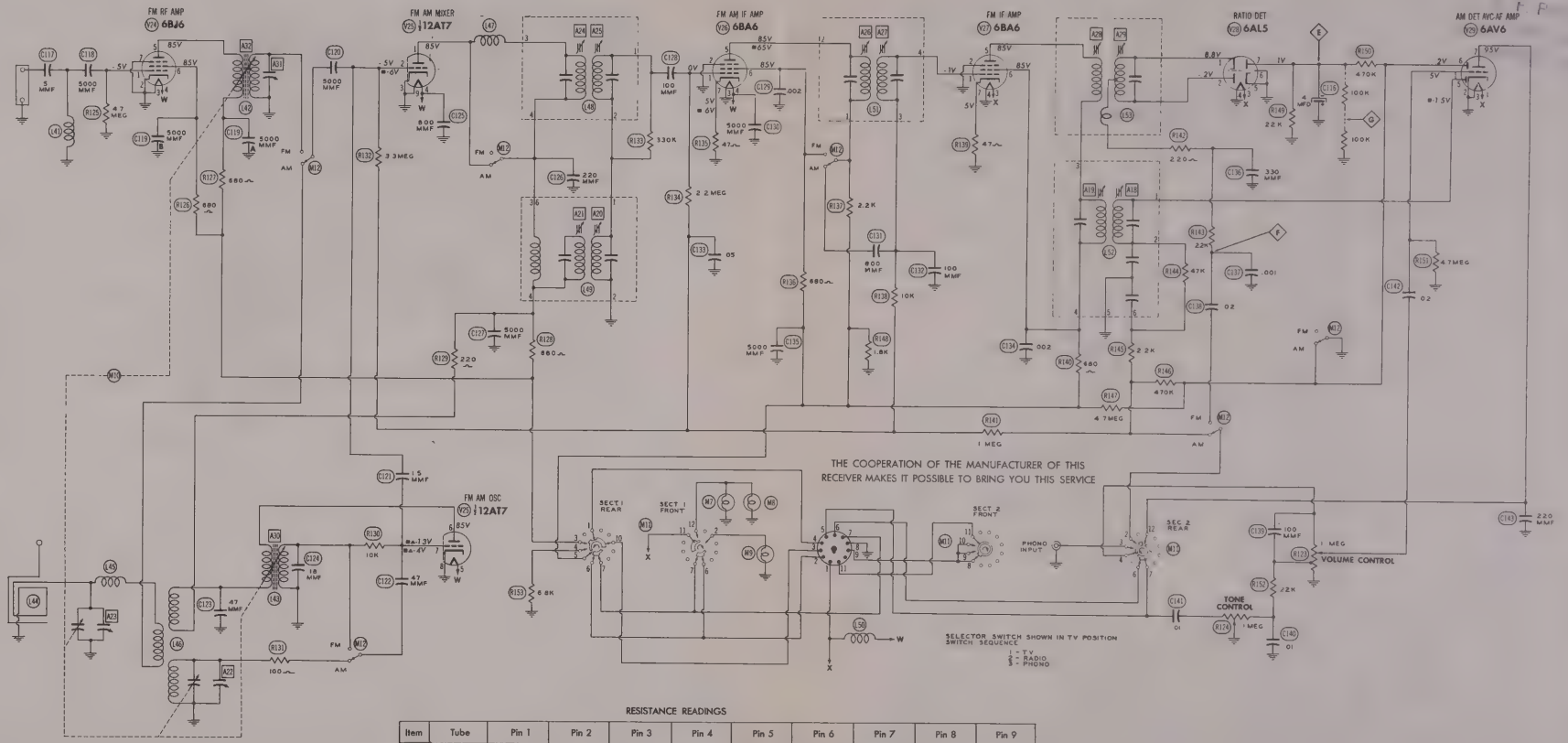
Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Disconnect phono motor plug, built-in antenna and transmission line from rear cover.
3. Remove 7 wood screws. Remove rear cover.
4. Disconnect speaker TV-Radio interconnecting cable, and ground lead between chassis.
5. Remove 4 wood screws holding speaker. Remove speaker.
6. Remove 4 chassis bolts. Remove TV chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE

1. Remove 6 push on type control knobs from front panel.
2. Disconnect FM antenna, phono audio lead.
3. Remove 4 screws. Remove FM antenna bracket and AM antenna.
4. Remove 1 screw. Remove phono compartment light.
5. Remove 3 chassis bolts. Remove radio chassis.


FM RF AMP V24 6BJ6
FM AM MIXER V25 12AT7
FM AM IF AMP V26 6BA6
FM IF AMP V27 6BA6
RATIO DET V28 6AL5
AM DET AVC AF AMP V29 6AV6
FM AM OSC V23 12AT7
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SECT 1 REAR
SECT 1 FRONT
SECT 2 FRONT
SECT 2 REAR
PHONO INPUT
VOLUME CONTROL
TONE CONTROL
SELECTOR SWITCH SHOWN IN TV POSITION
SWITCH SEQUENCE
1 - TV
2 - RADIO
3 - PHONO

RESISTANCE READINGS

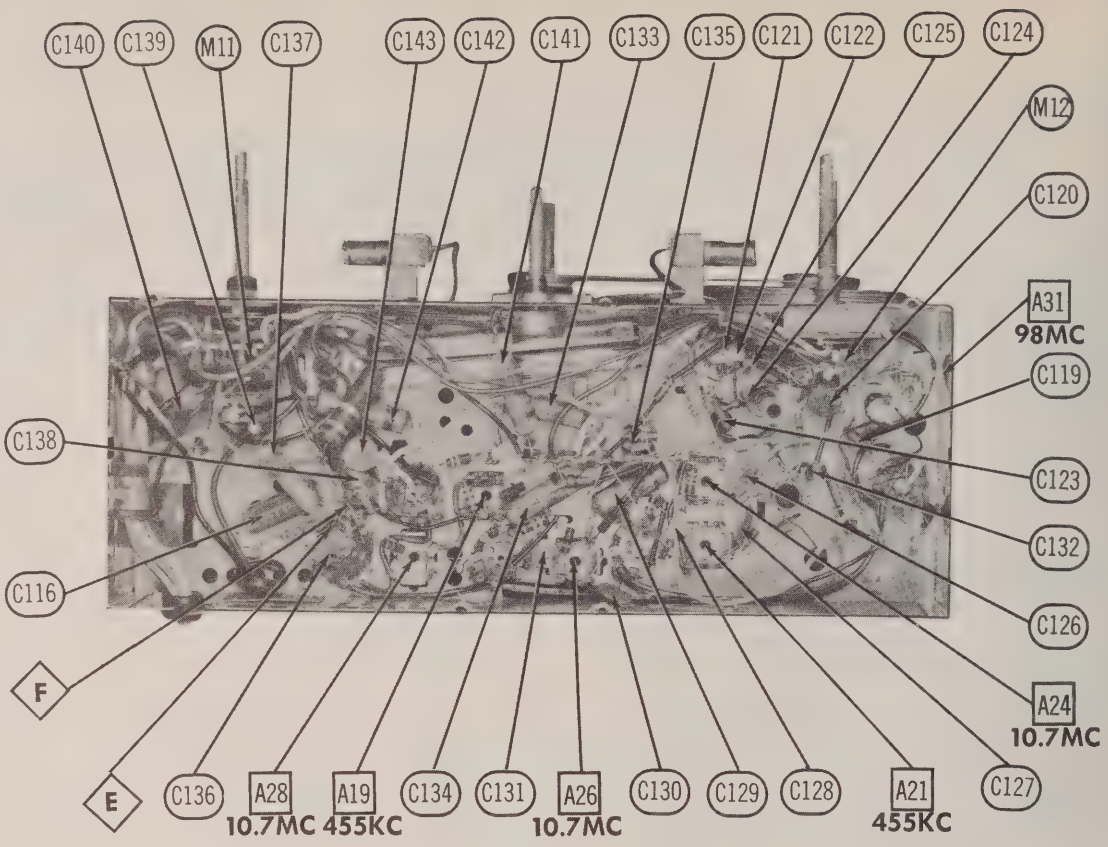
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 24	6BJ6	4.7Meg	0Ω	0Ω	.1Ω	†680Ω	†680Ω	0Ω		
V 25	12AT7	†680Ω	5.2Meg	0Ω	.1Ω	.1Ω	†900Ω	10KΩ	0Ω	0Ω
V 26	6BA6	4.1Meg	0Ω	0Ω	.1Ω	†520Ω †■2.2KΩ	†520Ω †680Ω	47Ω		
V 27	6BA6	1.9Meg ■1.5Meg	0Ω	.1Ω	0Ω	†680Ω	†680Ω	47Ω		
V 28	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	22KΩ		
V 29	6AV6	4.7Meg	0Ω	0Ω	.1Ω	900KΩ	460KΩ	#330KΩ		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE NOTED
■ MEASURED IN "AM" POSITION
† MEASURED FROM PIN 4, RADIO TO TV PLUG
# MEASURED TO PIN 8 OF V22

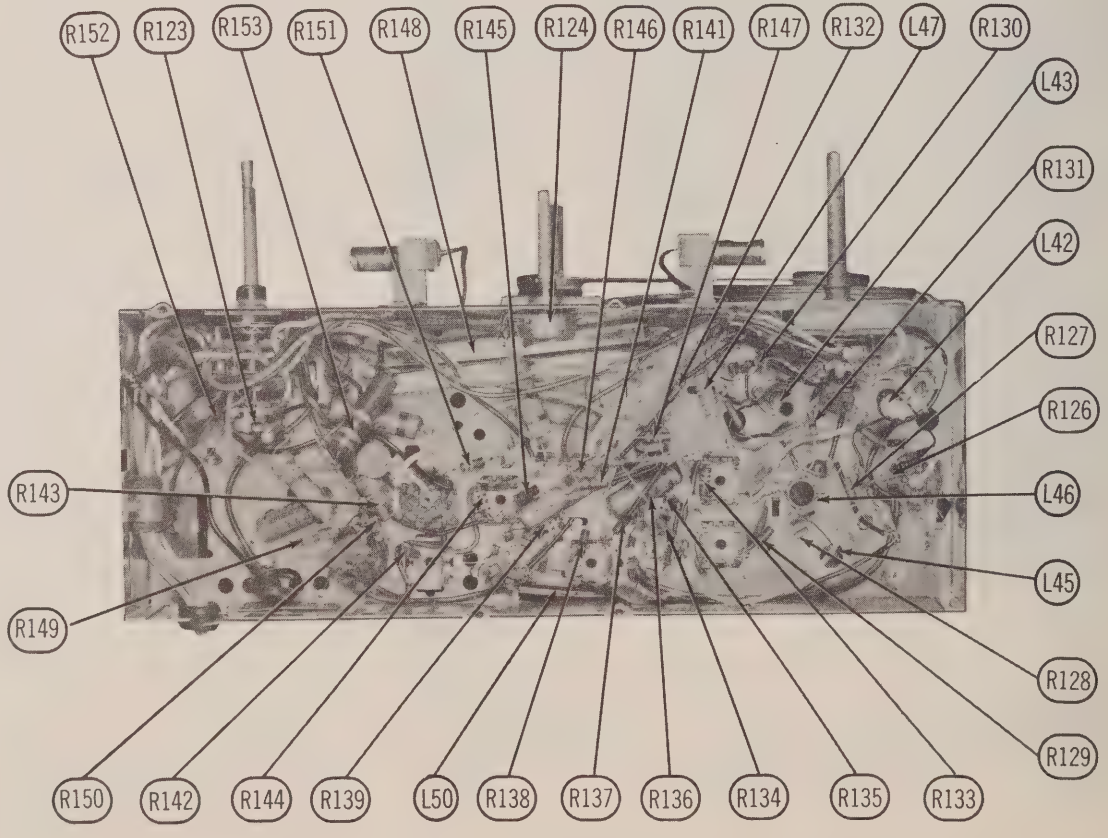
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1953

WESTINGHOUSE MODELS H-730C21, H-732C21,
H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

RADIO SCHEMATIC



RADIO CHASSIS-BOTTOM VIEW



RADIO CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6AK5	6AK5	7BD	
V2	Converter	6X8	6X8	9AK	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Ampl	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	12BY7	12BY7	9BF	
V7	AGC Keying	6AU6	6AU6	7BK	
V8	1st Sound IF Amp.	6AU6	6AU6	7BK	
V9	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier-AGC Clamper	6T8	6T8	9E	
V11	Audio Output	6W6GT	6W6GT	7AC	
V12	Audio Output	6W6GT	6W6GT	7AC	
V13	Sync. Amplifier-Sync. Seperator	12AT7	12AT7	9A	
V14	Noise Clipper-Vert. Output	12BH7	12BH7	9A	
V15	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Sync. Clipper	6C4	6C4	6BG	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	12AU7	12AU7	9A	
V19 A	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
B	Horiz. Output	6AU6GT	6AU6GT	6CK	
C	Horiz. Output	6AV5GT	6AV5GT	6CK	
V20	Damper	6W4GT	6W4GT	6CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	

PROPERTY OF L. E. ... DENVER ...

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V23	21FP4A	21FP4A 21FP4 ①		12C 12C	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	V-9891	E4D320		UPT4445-3335		FP428.4	TVL-4720	
B	■40	450								
C	▲30	350								
D	30	350								
C2	10	450	V-10293-1	PRS450/10		BR1045A		TC72	TVA-1705	
C3A	▲30	450	V-10306-1	E4C378					TVL-3753	
B	▲150	50								
C	■10	450								
C4A	10	450	V-107861	PRS450/10-10		BRD1145A		TCD72	TVA-2722	Blue
B	10	450		PRS450/30		BR3045A		TC77	TVA-1711	Green
C	30	450								Red
C5	30	450	V-6570	PRS450/30		BR3045A		TC77	TVA-1711	
C6	30	450	V-6570	PRS450/30		BR3045A		TC77	TVA-1711	
C7	4	50	V-4637	PRS150/4		BR550		TC30	TVA-1303	
C8	22			SI22	D6-220		GP1K-220	UC-5422	5GA-Q22	
C9	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C10	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C11	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C12	470			SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C13	.36									
C14	1.2				TCZ-1.2		NP0K-1R2			
C15	.5									
C16	47			SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C17	.5									
C18	1.5						N330K-1R5			
C19	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C20	1				TCZ-1		NP0K-010			
C21	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	470			SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C23	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C24	.82									
C25	22				TCZ-22		NP0K-220		5TCC-Q22	
C26	22				TCZ-22		NP0K-220		5TCC-Q22	
C27	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C28	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C29	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C30	7.5									
C31	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C32	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	150	500	RCM20B151J	1469-00015		5R5T15			MS-315	
C35	12		R3CC20SL120K		TCZ-12		NP0K-120			
C36	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C37	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C38	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	1		V-5658-1		TCZ-1		NP0K-010		5TCCB-V1	
C40	12		R3CC20SL120K	SI12	D6-120		GP1K-120			
C41	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C42	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C43	1		V-5658-1		TCZ-1		NP0K-010		5TCCB-V1	
C44	12		R3CC20SL120K	SI12	D6-120		GP1K-120	UC-5412	5GA-Q12	
C45	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C46	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C47	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C48	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C49	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C50	3.3		V-9926-2	SI3.3NP0	TCZ-3.3		NP0K-3R3		5TCCB-V33	
C51	12		R3CC20SL120K	SI12	D6-120		GP1K-120	UC-5412	5GA-Q12	

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	5		V-9926-3	5I5NP0	TCS-4.7		NP0K-050	ZT-555	5TCCB-V47	
C53	470	500	RCM20B471K	1468-0005	DS-471	5W5T5	GP5K-471	MC345	1FM-35	
C54	7		V-5558-13	5I6.5NP0	TCS-6.8		NP0K-6R8	ZT-5568	5TCCB-W68	
C55	56	500	RCM20B560K							
C56	5000		V-5596	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C57	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C58	.5	300	RCP10W4504M	P388-5		PJ2P5		PT405	3TM-P5	
C59	5000		V-5596	BPD-005	DD-502	TMSD6	811-005	DC-525	5HK-D5	
C60	8		V-9926-3	5I5NP0	TCS-4.7		NP0K-050	ZT-555	5TCCB-V47	
C61	150	500	RCM20B151K	1469-00015		5R5T15		GP2-333-302	MCB236	MB-315	
C62	.002	600	RCP10W6202M	P688-002		DD-502	TMED2	GP2-333-202	PT622	6TM-D2	
C63	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C64	5000		V-5596	BPD-005		DD-503	TMSD5	811-005	DC-525	5HK-D5	
C65	150	500	RCM20B151K	1469-00015			5R5T15		MCB236	MB-315	
C66	47	500	RCM20B470K	1468-00006	DS-470		5W5G5	GP1K-470	MC325	1FM-45	
C67	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C68	820	500	RCM20C821K							
C69	.001	400	RCP10W6102M	P488-001		D6-102	PTE8D1	GP3L-102	PT621	6TM-D1	
C70	.03	400	RCP10W4303M	P488-02		DF-303	PTE4S2		PT402	4TM-S2	
C71	.01	400	RCP10W4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C72	.01	400	RCP10W4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C73	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C74	.001	500	RCM30B181M	1468-00015		5W5T15	GP3K-181	MC336	1FM-315		
C76	.005	400	RCP10W4502M	P488-005		D6-502	PTE8D5	GP2-233-502	PT625	6TM-D5	
C77	.5	300	RCP10W4504M	P388-5			PJ2P5		PT405	3TM-P5	
C78	.001	500	RCM30B681K	1469-0007	D6-681		1W5T7	GP1K-681	UC-5368	MS-37	
C79	.01	600	RCP10W6103M	P688-01		D6-103	PTE8S1	GP2-333-103	PT611	6TM-S1	
C80	270	500	RCM20B271K	1468-0003		D6-271	5W5T3	GP1K-271	MC341	1FM-33	
C81	.01	400	RCP10W4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C82	.25	400	RCP10W4254M	P488-25			PTE4P25		PT4025	4TM-P25	
C83	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C84A	.01			P688-01			PT6S1		PT611	6TM-S1	
B	.002		♦V-11198-1	P688-002		♦PC-101	PTE8D1		PT622		
C	.005			P688-005			PTE8D5		PT625		
D	.005			P688-005			PTE8D5		PT625		
C86	.01	400	RCP10W4103K	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C86	.05	400	RCP10W4503M	P488-05		DF-503	PTE4S5		PT405	4TM-S5	
C87	.05	600	RCP10W6503K	P688-05		DF-503	PTE6S5		PT605	6TM-S5	
C88	.1	600	RCP10M6104M	P688-1		DF-104	PTE8P1		PT601	6TM-P1	
C89	.1	400	RCP10W4104M	P488-1		DF-104	PTE4P1		PT401	4TM-P1	
C90	.01	600	RCP10W6103M	P688-01		D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C91	100	500	RCM20B101K	1469-0001			5R5T1		MCB235	MB-31	
C92	100	500	RCM20B101K	1469-0001			5R5T1		MCB235	MB-31	
C93	330	500	RCM20B331K	1469-00035							
C94	680	500	RCM20B681K	1479-0007			2R5T7			MS-37	
C95	.01	400	RCP10W4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C96	.005	400	RCP10W4502M	P488-005		D6-502	PTE4S5	GP2-233-502	PT405	4TM-S5	
C97	.01	400	RCP10W4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C98	.1	600	RCP10W6104M	P688-1		DF-104	PTE6P1		PT601	6TM-P1	
C99	3900		RCM30C392K	1467-004			1N5D4		MC3463	MB-34	
C100	.1	400	RCP10W4104M	P488-1		DF-104	PTE4P1		PT401	4TM-P1	
C101	100	500	RCM20B101K	1469-0001			5R5T1		MCB235	MB-31	
C102	100	500	RCM20B101K	1469-0001			5R5T1		MCB235	MB-31	
C103	.1	400	RCP10W4104M	P488-1		DF-104	PTE4P1		PT401	4TM-P1	
C104	820	500	RCM20C821K								
C105	.01	600	RCP10M6103M	P688-01		D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C106	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C107	.1	600	RCP10M6104M	P688-1		DF-104	PTE6P1		PT601	6TM-P1	
C108	.1	400	RCP10W4104M	P488-1		DF-104	PTE4P1		PT401	4TM-P1	
C109	.06	600	RCP10M6603M	P688-06			PTE6S6		PT616	6TM-S6	
C110	.06	600	RCP10M6603M	P688-06			PTE6S6		PT616	6TM-S6	
C111	.25	400	RCP10W4254M	P488-25			PTE4P25		PT4025	4TM-P25	
C112	500	20000	V-9901-3	HV30C		TV3-502	MMC-230TS	413-501		30DK-T5	
C113	5000		V-5596	BPD-005		DD-502	TMSD5	811-005	DC-525	5HK-D5	
C114	.01	600	V-5040-15	6892GXY-01			PT6S1		PT611	6TM-S1	
C115	.01	600	V-5040-15	6892GXY-01			PT6S1		PT611	6TM-S1	

♦ Items C84A, C84B, C84C, C84D, R86A, R86B, R86C, R86D are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	V-9877-4	QJ-382 *	RTV-288	SBB-704-S	UF152L UR55-T54 UR-26	Contrast -Panel Volume Tap ⓐ 50KΩ rear Attach to R1B
B	500KΩ	½					U-35	Brightness
C	Switch		V-10914-1	QU-123	AG-44-S	AB-31	Not Req.	Attach to R2A
R2A	50KΩ	½	Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A
R3A	125KΩ	½	V-10915-1	QU-128	AG-52-S	AB-40	U-416	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R4A	5000Ω	½	V-8463	QU-114	AG-18-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R4A
R5A	750KΩ	½	V-9894-3	QU-139	AG-61-S	AB-49	SU-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-1	Not Req.	Attach to R5A
R6A	250KΩ	½	V-9813-4	QU-130	AG-55-S	AB-50	SU-46	Height
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R6A
R7A	2 Meg	½	V-9894-2	QU-139	AG-83-S	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	KS8-3	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT -KIT K-2, BASE ELEMENTS & SHAFTS B17-109 & P1-218 (Panel), B18-133X & R2-226 (Rear) & SWITCH 78-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	IRC PART No.	NOTES
R8	15KΩ	½		BTS-15K	
R9	1000Ω	½		BTS-1000	
R10	8200Ω	½		BTS-8200	
R11	2200Ω	½			
R12	2200Ω	½		BTS-2200	
R13	2200Ω	½		BTS-2200	
R14	15KΩ	½		BTS-15K	
R15	4700Ω	½		BTS-4700	
R16	1000Ω	½		BTS-1000	
R17	3900Ω	½		BTS-3900	
R18	220Ω	½		BTS-220	
R19	200Ω	½			
R20	150Ω	½	RC20AE151K	BTS-150	
R21	1.5Meg	½	RC20AE155K	BTS-1.5Meg	
R22	2200Ω	½	V-9927-9	BTS-2200	
R23	100Ω	½	RC20AE100K		
R24	68Ω	½	RC20AE680K		
R25	2700Ω	½	RC20AE272K	BTS-2700	

RESISTORS (CONT.)

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	IRC PART No.	NOTES
R26	68KΩ	½	RC20AE683K	BTS-68K	
R27	33KΩ	½	RC20AE333K	BTS-33K	
R28	10KΩ	½	RC20AE103M	BTS-10K	
R29	4700Ω-5%	½	V-9927-2	BTS-4700-5%	
R30	68Ω	½	RC20AE680K		
R31	470Ω	½	RC20AE471M	BTS-470	
R32	4700Ω-5%	½	V-9927-2	BTS-4700-5%	
R33	150Ω	½	RC20AE151K	BTS-150	
R34	470Ω	½	RC20AE471M	BTS-470	
R35	12KΩ	½	RC20AE123K	BTS-12K	
R36	220Ω	½	RC20AE221M		
R37	3300Ω	½	RC20AE332K	BTS-3300	
R38	100KΩ	1	RC30AE104K	BTA-100K	
R38	22KΩ	½	RC20AE223K	BTS-22K	
R40	3900Ω	2	RC40AE392K	BTS-3900	
R41	100KΩ	½	RC20AE104K	BTS-100K	
R42	100KΩ	½	RC20AE104K	BTS-100K	
R43	470KΩ	½	RC20AE474K	BTS-470K	
R44	12KΩ	½	RC20AE123K	BTS-12K	
R45	86KΩ	1	RC30AE883K	BTA-68K	
R46	12KΩ	½	RC20AE123K	BTS-12K	
R47	4700Ω	1	RC30AE472K	BTA-4700	
R48	27KΩ	½	RC20AE273K	BTS-27K	
R49	220KΩ	½	RC20AE224K		
R50	12KΩ	½	RC20AE123K		
R51	22KΩ	½	RC20AE223K	BTS-22K	
R52	27KΩ	½	RC20AE273K	BTS-27K	
R53	12KΩ	½	RC20AE123K	BTS-12K	
R54	10KΩ	½	RC20AE103M	BTS-10K	
R55	10 Meg	½	RC20AE106M	BTS-10 Meg	
R56	560Ω	½	RC20AE561K	BTS-560	
R57	4.7Meg	½	RC20AE475K	BTS-4.7Meg	
R58	1 Meg	½	RC20AE105K	BTS-1 Meg	
R59	150Ω	½	RC20AE151K		
R60	1 Meg	½	RC20AE105K	BTS-1 Meg	
R61	47Ω	½	RC20AE470M		
R63	150Ω	½	RC20AE151K		
R63	39KΩ	1	RC30AE393K	BTA-39K	
R64	300Ω	½	V-9087-12		
R65	150Ω	½	RC20AE151K		
R66	1.2Meg	½	RC20AE125K	BTS-1.2Meg	
R67	15KΩ	2	RC40AE153K	BTS-15K	
R68	470Ω	½	RC20AE470M		
R69	150Ω	½	RC20AE151K		
R70	15KΩ	5	V-11328-3	1 3/4A-15K	
R71	330Ω	½	RC20AE334K	BTS-330K	
R72	1.2Meg	½	RC20AE125K	BTS-1.2Meg	
R73	470Ω	10	V-11328-8	1 3/4A-500	
R74	15KΩ	3	RC40AE153K	BTS-15K	
R75	4700Ω	1	RC30AE472K	BTA-4700	
R76	4700Ω	½	RC20AE472K	BTS-470	
R77	470KΩ	½	RC20AE474K	BTS 470K	
R78	1 Meg	½	RC20AE105K	BTS-1 Meg	
R79	150KΩ	½	RC20AE154K	BTS-150K	
R80	220KΩ	½	RC20AE224K	BTS-220K	
R81	680KΩ	½	RC20AE684K	BTS-680K	
R82	680KΩ	½	RC20AE684K	BTS-680K	
R83	18KΩ	5	V-11328-3	1 3/4A-15K	
R84	27KΩ	½	RC20AE273K	BTS-27K	
R85	6800Ω	½	RC20AE682K	BTS 6800	Note 1
R86A	22KΩ	½		BTS-22K	
B	22KΩ	½	♦ V-11192-1	BTS-22K	
C	8200Ω	½		BTS-8200	
D	8200Ω	½		BTS-8200	
R87	100KΩ	1	RC30AE104K	BTA-100K	
R88	1200Ω	½	RC20AE122K	BTS-1200	
R89	560KΩ	½	RC20AE564K	BTS-560K	
R90	100KΩ	½	RC20AE104K	BTS-100K	
R91	39KΩ	½	RC20AE393K	BTS-39K	
R92	47KΩ	½	RC20AE473K	BTS-47K	Note 3
R93	68000Ω	½	RC20AE682K	BTS-6800	
R94	3300Ω	½	RC20AE332K	BTS-3300	
R95	2.2Meg	½	RC20AE225K	BTS-2.2Meg	
R96	470Ω	5	RC20AE471K	BTS-470	
R97	10KΩ	5	V-11328-2	1 3/4A-10K	
R98	4700Ω	½	RC20AE472K	BTS-4700	
R99	1 Meg	½	RC20AE105K	BTS-1 Meg	
R100	1 Meg	½	RC20AE105K	BTS-1 Meg	
R101	1 Meg	½	RC20AE105K	BTS-1 Meg	
R102	220KΩ	½	RC20AE224K	BTS-220K	
R103	470KΩ	½	RC20AE474K	BTS-470K	
R104	47KΩ	½	RC20AE473K	BTS-47K	
R105	820Ω	½	RC20AE821K	BTS-820	
R106	27KΩ	½	RC20AE273K	BTS-27K	
R107	300KΩ-5%	½		BTS-300K-5%	Note 2
R108	270KΩ	½	RC20AE274K	BTS-270K	
R109	120KΩ	½	RC20AE123K	BTS-12K	
R110	33KΩ	½	RC20AE333K	BTS-33K	
R111	56KΩ	1	RC30AE563K	BTA-56K	
R112	150KΩ	1	RC30AE154K	BTA-150K	
R113	150KΩ	1	RC30AE154K	BTA-150K	
R114	33KΩ	½	RC20AE333K	BTS-33K	
R115	470KΩ	½	RC20AE474K	BTS-470K	
R116	150Ω	½	RC20AE151K		
R117	33Ω	1	RC30AE330K		
R118	12KΩ	10	V-11328-1	1 3/4A-12K	
R119	39KΩ	2	RC40AE393K	BTS-39K	
R120	10KΩ	½	RC20AE103K	BTS-10K	
R121	330KΩ	1	V-9927-7		
R122	220KΩ	1	RC30AE224M	BTA-220K	

♦ Items R86A, R86B, R86C, R86D, C84A, C84B, C84C, C84D are combined in one unit.
Note 1. Some Models use a 4700Ω resistor in this application.
Note 2. Some Models use a 100KΩ resistor in this application.
Note 3. Some Models use a 330K'Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC ⓖ 1.86A	653VCT .200ADC	5VAC ⓖ 3A	6.3VCT ⓖ 3.15A	V-9958-2	P-8169 ①		TP-324	R-50BC

① Add high voltage dropping resistor.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	540Ω tap ⓐ 30Ω	12.7Ω tap ⓐ .7Ω, 8.7Ω SEC. 2 0Ω	V-10214-1	A-8130 ①	HVO-10 ②	TFB-5 ③	D-14 ④	Horiz. Output Trans.
T3	1800Ω tap ⑥ 7Ω		V-10909-1	A-8141	A-3039	T3O-12	A-104X	Vert. Output Trans.
T4A	13.5Ω		V-10911-3 ⑤	DY-9A ⑥	MDF-70 ⑦	TY-5 ⑧	Y-17 ⑨	Horiz. Deflection Coils
B	57Ω							Vert. Deflection Coils

① Use with Width Coil WC-5.
② Drill new mounting holes.
③ Use Width Coil (with AGC Winding) with approx. range of 4-29 Millihearies
④ Use with Width Coil WC-11
⑤ Yoke assembly contains Yoke V-10638-6
⑥⑦⑧⑨ Use original deflection network capacitor

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	3KΩ	3.3Ω	197Ω	.68Ω	V-11360-1	A-3925	A-3018 ①	RO-304 ①	S-1X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP.	Westinghouse PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.3Ω	V-11439-1	10J11	10A31	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
LJ	.300A	40Ω	1.24HY	V-6471-2	C-2326 ①	C-2991 ①	TR-1733 ①	C-23X ①

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Westinghouse PART No.	MERIT PART No.	IRC PART No.	NOTES
L3	Ant. Trans.	0Ω	0Ω				Low channel secondary - 0Ω.
L3	Ant. Coils	0Ω					
L4	Ant. Coil	0Ω					Channel 13.
L5	UHF 1 Coupling Coil	0Ω					
L6	UHF 2 Coupling Coil	0Ω					
L7	FU. Choke	0Ω					
L8	RF Coil	0Ω					Channel 13.
L9	RF Coils	0Ω					
L10	Mixer Grid Coil	0Ω					Channel 13
L11	Mixer Grid Coils	0Ω					
L12	Osc. Plate Coil	0Ω					
L13	Osc. Coils	0Ω					
L14	Conv. Plate	.1Ω					
L15	1st. Video IF	0Ω		V-9882-4			
L16	Sound Trap	0Ω		V-10771-1			
L17	FU. Choke	0Ω		V-4586-2			1.1 Microhenries.
L18	2nd Video IF	.5Ω	.5Ω	V-9879			
L19	Adj. Channel Sound Trap	0Ω		V-10771-1			
L20	FU. Choke	0Ω		V-4586-2			1.1 Microhenries.
L21	3rd Video IF	.5Ω	.5Ω	V-9879			
L22	4th Video IF	.5Ω	.4Ω	V-9880			
L23	Series Peaking Coil	1.2Ω		V-4586-1	TV-180		14 Microhenries.
L24	Series Peaking Coil	4.4Ω		V-9915-1	TV-182		100 Microhenries.
L25	Shunt Peaking Coil	1.2Ω		V-4586-1	TV-180		14 Microhenries.
L26	FU. Choke	0Ω		V-4586-2			1.1 Microhenries
L27	4.5MC Trap	1.3Ω		V-9882-3	TV-151		
L28	Series Peaking Coil	5.3Ω		V-5902-1	TV-184		140 Microhenries
L29	Shunt Peaking Coil	5.5Ω		V-5902-5	TV-185		250 Microhenries.
L30	Series Peaking Coil	1.2Ω		V-4586-1	TV-185		14 Microhenries.
L31	1st Sound IF	3Ω		V-9882-5	TV-151		1.1 Microhenries
L32	FU. Choke	0Ω		V-4586-2			
L33	2nd Sound IF	.3Ω		V-9882-5	TV-151		
L34	Ratio Det.	4.1Ω	1.2CT	V-9884	TV-110*		Tertiary winding: .8Ω
L35	Horiz. Osc.	125Ω		V-9764	TV-183		
L36	RF Choke	2.2Ω		V-9099-5		CLA	2.7 Microhenries.
L37	Horiz. Lin	30Ω		V-9160	MWC-1		
L38	Width Coil	1Ω	95Ω	V-9902			
L39	RF Coil	0Ω		V-4586			1.1 Microhenries.
L40	FU. Choke	2.2Ω		V-9099-5		CLA	2.7 Microhenries.

* Drill new mounting holes

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	RF Tuner	V-10880-2	
M2	Crystal	V-10918-1	Video Detector
M3	Centering Magnet		On rear of yoke cover.
M4	Ion Trap	V-9784-4	
B1	Trimmer	V-11238-1	Horizontal Multivibrator
	Cabinet	V-1378-1	Model H-730C21
	Back Cover	V-10963-10	Model H-730C21
	Knob	V-9938-5	Off/On TV Volume, Models H-730C21 & H-733C21
	Knob	V-9938-4	Off/On TV Volume, Model H-733C21
	Knob	V-9939-8	Contrast, Models H-730C21 & H733C21
	Knob	V-9939-5	Contrast, Model H-732C21
	Knob	V-9940-4	Fine Tuning, Models H-730C21 & H-733C21
	Knob	V-9940-3	Fine Tuning, Model H-733C21
	Knob	V-10938-1	Horizontal Hold & Brightness (2 Used),
	Knob	V-11146-2	Channel Selector, Models H-730C21 & H-733C21
	Knob	V-11146-1	Channel Selector, Model H-733C21
	Mask	V-10939-2	Models H-730C21 & H-733C21
	Mask	V-10939-1	Model H-733C21
	Cable & Socket Assembly	V-11356-1	TV to Radio

WESTINGHOUSE MODELS H-730C21, H-732C21, H-733C21 (Ch. V-2218-1 & Radio Ch. V-2180-9, -10)

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V24	FM RF Amplifier	6BJ6	6BJ6	7CM	
V25	FM AM Converter	12AT7	12AT7	9A	
V26	1st. FM AM IF Amp	6BA6	6BA6	7BK	
V27	2nd FM IF Amp	6BA6	6BA6	7BK	
V28	Ratio Detector	6AL5	6AL5	6BT	
V29	AM Detector-AVC-AF Amplifier	6AV6	6AV6	7BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C116	4	50	V-4637	PRS150/4		BR550		TC30	TVA-1303	
C117	5		V-9926-3	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C118	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C119A	5000		V-9944-1	BPD-2X0047	DD-502	TM5D5	811-005	DC-525	5HK-2D47	
B	5000				DD-502	TM5D5	811-005	DC-525		
C120	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C121	1.5		V-5658-9	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C122	47		R2CC30RK470K							
C123	47		V-10710-3							
C124	18									
C125	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C126	220		V-10710-2	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C127	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C128	100		R4CC21YY101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C129	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C130	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C131	800		V-9863-1	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C132	100		R4CC21YY101M	SI100	D6-101	TM5T1	GP1K-101	UC-532	5GA-T1	
C133	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C134	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C135	5000		V-5596	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C136	330	500	RCM20A331M	1469-00035						
C137	.001	600	RCP10W6102M	P688-001	D6-102	PTEGD1	GP2L-102	PT621	6TM-D1	
C138	.02	200	RCP10W2203M	P488-02	DF-203	PTEYS2		PT412	4TM-S2	
C139	100		R4CC21YY101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C140	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C141	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C142	.02	200	RCP10W2203M	P488-02	DF-203	PTE452		PT412	4TM-S2	
C143	220		V-10710-2	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R123	1 Meg	½	V11361-1 *					Volume & Function Switch
R124A	1 Meg	½	V-10130-5	Q13-137	AG-63-Z	B-70	U-53	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R124A

* Includes function switch, replace only with complete unit.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R125	4.7Meg	½	RC20AE475M	BTS-4.7Meg	
R126	680Ω	½	RC20AE681M	BTS-680	
R127	680Ω	½	RC20AE681M	BTS-680	
R128	680Ω	½	RC20AE681M	BTS-680	
R129	220Ω	½	EC20AE221M		
R130	10KΩ	½	RC20AE103K	BTS-10K	
R131	100Ω	½	RC20AE101M		
R132	3.3Meg	½	RC20AE335M	BTS-3.3Meg	
R133	330KΩ	½	RC20AE334M	BTS-330K	
R134	2.2Meg	½	RC20AE225M	BTS-2.2Meg	
R135	47Ω	½	RC20AE470M		
R136	680Ω	½	RC20AE681M	BTS-680	
R137	2200Ω	½	RC20AE222M	BTS-2200	
R138	10KΩ	½	RC20AE103M	BTS-10K	
R139	47Ω	½	RC20AE470M		

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R140	680Ω	½	RC20AE681M	BTS-680	
R141	1 Meg	½	RC 20AE105M	BTS-1 Meg	
R142	220Ω	½	RC20AE221M	BTS-220	
R143	22KΩ	½	RC20AE223M	BTS-22K	
R144	47KΩ	½	RC20AE473M	BTS-47K	
R145	2200Ω	½	RC20AE222M	BTS-2200	
R146	470KΩ	½	RC20AE474M	BTS-470K	
R147	4.7Meg	½	RC20AE475M	BTS-4.7Meg	
R148	1800Ω	10	V-11328-5	1 3/4A-1750	
R149	22KΩ	½	RC20AE223K	BTS-22K	
R150	470KΩ	½	RC20AE474M	BTS-470K	
R151	4.7Meg	½	RC20AE275M	BTS-4.7Meg	
R152	22KΩ	½	RC20AE223M	BTS-22K	
R153	6800Ω	2	RC40AE682K	BTB-6800	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
L41	FM Ant. Coil	0Ω		V-10644-1			
L42	FM RF Coil	0Ω	0Ω	V-11240-1			
L43	FM Osc. Coil	0Ω	0Ω	V-11239-1			
L44	AM Loop Ant.	0Ω	1.2Ω	V-10816-2			
L45	RF Choke	2.2Ω		V9099-5		CLA	2.7 Microhenries.
L46	AM Osc. Coil	3.8Ω	9.5Ω	V-10944-1			Pick-up winding-1.8Ω
L47	RF Choke	0Ω		V-4886-14			
L48	1st FM IF	0Ω	.9Ω	V-9688	FM-254		
L49	1st AM IF	4.6Ω	11Ω	V-10619			Tertiary winding - 11Ω
L50	Fil. Choke	0Ω		V-48862			1.1 Microhenries.
L51	2nd FM IF	2.2Ω	2.4Ω	V-11264-1	FM-254		
L52	2nd AM IF	15Ω	15Ω	V-10350-1	BC-355		
L53	Ratio Det.	2.6Ω	.3ΩCT	V-9828	FM-255		Tertiary winding - .25Ω

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	Westinghouse PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M5	V-8350	AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THEIR RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

...TTY OF ...
...RKENSHIP
...MAIN ST.
DENVER, COLORADO

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

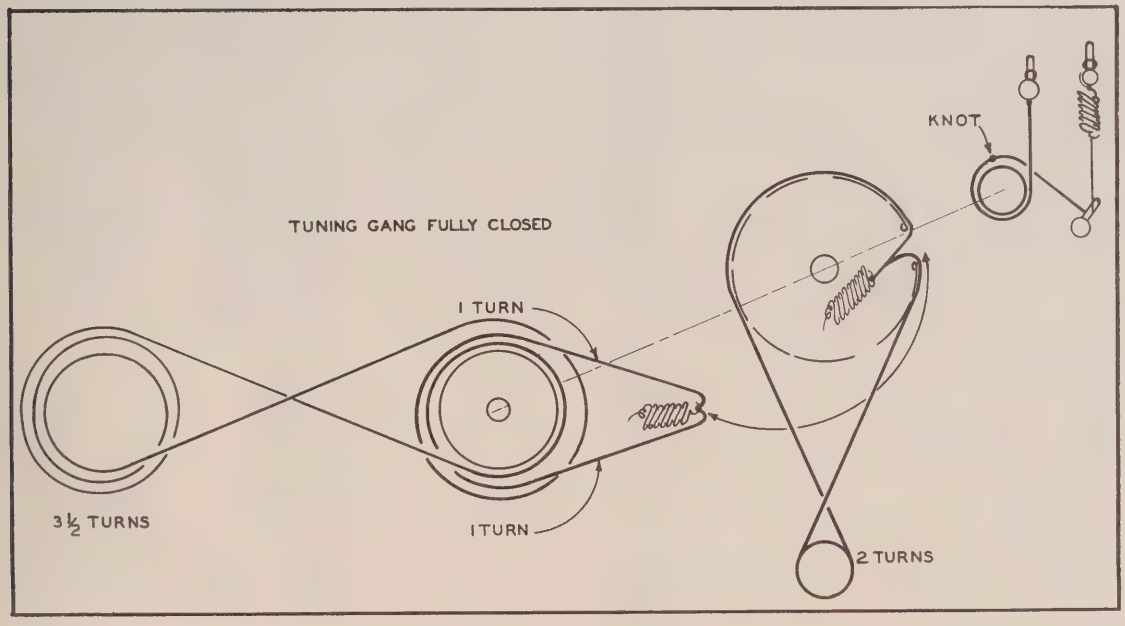
ITEM No.	REPLACEMENT DATA			REMARKS
	Westinghouse PART No.	WALCO PART No.	JENSEN PART No.	
M6	V-8351	W-30AGA or W-30AGS	JP-312	

DIAL LIGHTS

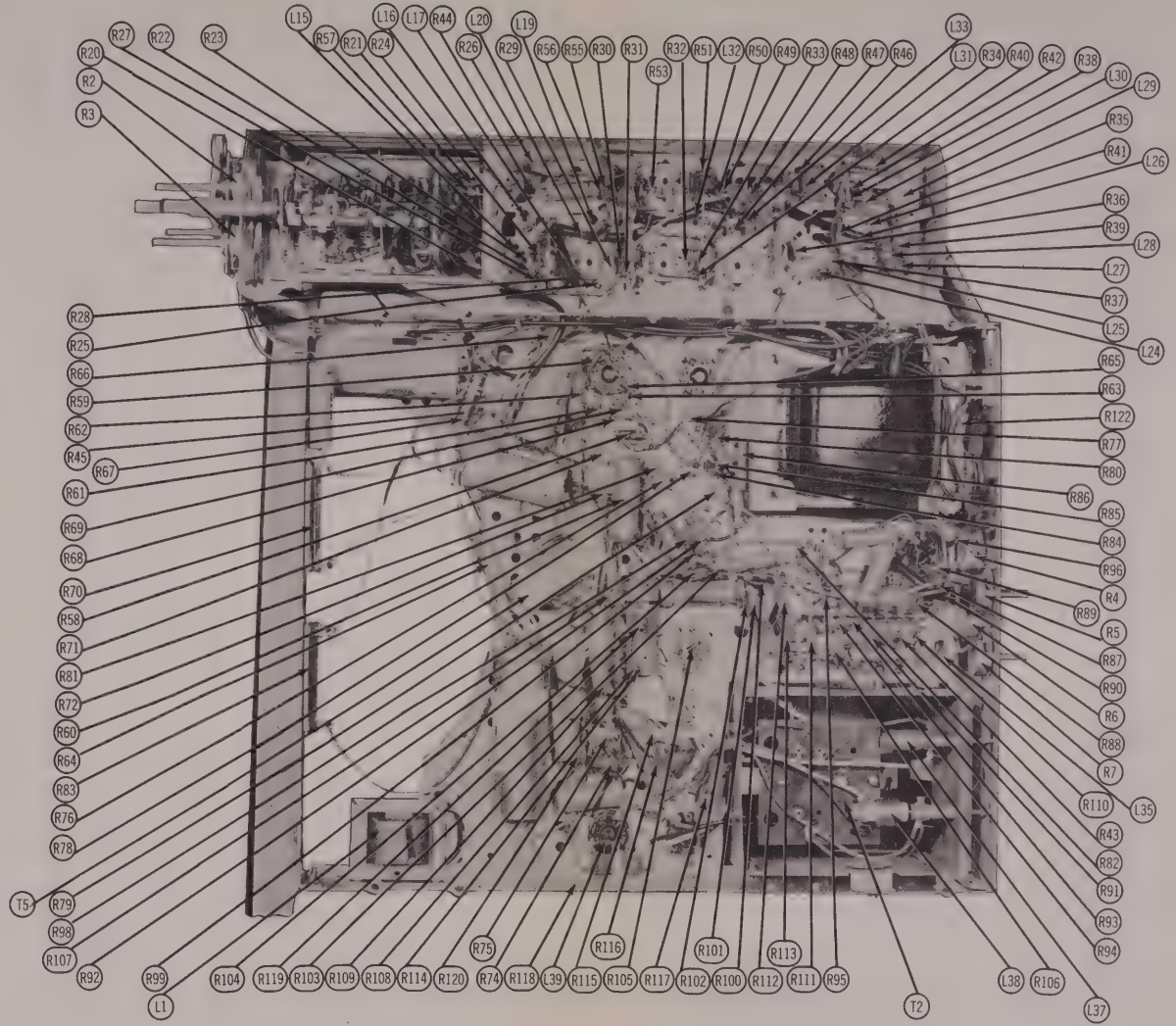
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Westinghouse PART No.		
M7	Bayonet	6-8	.25	Blue			Type #44
M8	Bayonet	6-8	.25	Blue			Type #44
M9	Bayonet	6-8	.25	Blue			Type #44

MISCELLANEOUS

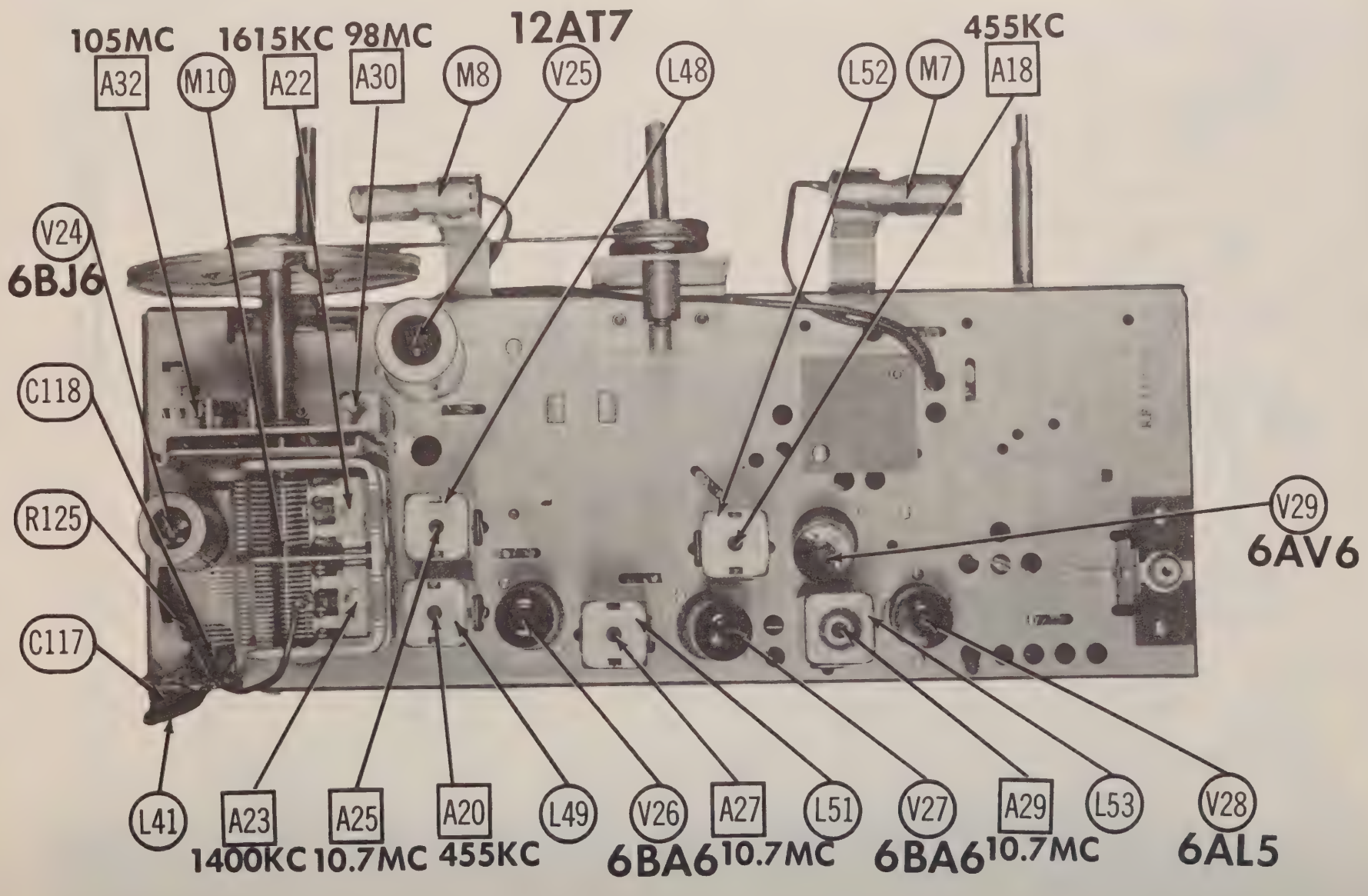
ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M10	Tuning Capacitor	V-10662-2	22-487MMF, 27-176MMF, (FM Tuning Core V-9676-1 (2 Used)
M11	Switch	V-11361-1	TV- Radio-Phono Sel. (Includes Radio Volume Control)
M12	Switch	V-10651-1	AM-FM Selector
	Knob	V-10408-8	AM-FM Sel. & Tone cont . (2 Used)
	Knob	V-10408-9	Volume Control
	Knob	V-11149-3	Tuning Control
	Knob	V-11149-4	TV-Radio-Phono Selector,
	Pointer	V-11145-2	
	Cable & Plug Assy.	V-11341-1	Radio to TV
	Cable	V-6415-4	Phono to Radio



RADIO DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RADIO CHASSIS-TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH MODELS
K777E, R (Ch. 7K20)

ZENITH MODEL K777R

TRADE NAME	Zenith Model K777E, K777R (Ch. 7K20)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver
TUBES (Seven)	Types 6BA6 RF Amp., 6BE6 Conv., 6J5 Phono Osc., 6BA6 IF Amp., 6AT6 Det.-AVC- AF Amp., 25L6GT Audio Output, 25Z6GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING .44 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to B-.	455KC (400∿ Mod.)	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620 KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400 KC	1400 KC	"	A6, A7	"

If receiver oscillates during phono operation adjust A8 to the point where oscillation ceases. Adjustment of A8 may sometimes be required if phono cartridge is changed.

RECORD CHANGER UNIT- ZENITH MODEL S-14048.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL K777R (Ch. 7K20)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	Phono Oscillator	6J5	6J5	6Q	
V4	IF Amplifier	6BA6	6BA6	7BK	
V5	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V6	Audio Output	25L6GT	25L6GT	7AC	
V7	Rectifier	23Z6GT	25Z6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	♦80	250	22-2391	AFH2-64		UP8445		FP377	TVL-2582	
B	♦40	250								
C2	10	250	22-2390	PRS250/12		BR1225A		TC52	TVA-1504	
C3	220	500	22-182	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C4	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.0005	600	22-854	SI500	D6-501	TM5T5	GP2K-501	UC-535	6TM-T5	
C6	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C7	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	47	500	22-2360	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C9	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C10	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C11	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C12	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C13	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C14A	.01									
B	250		♦105-27		♦PC-80		♦1404-01		♦102C1	Note 1
C										Note 2
C15	.01	600	22-669	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C16	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C17	.047	400	22-1775	489ZGXY-05		PJ4S47		PT4147	4TM-S47	
C18	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	

♦ Items C14A, C14B, C14C, R16A, R16B are combined in one unit.
When replacing items separately C14B and C14C should total 250MMF.
Note 1. Some Models use 500MMF in this application
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	63-2787	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	63-2788	Q14-133	AG-58-S	AB-61	U-50	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

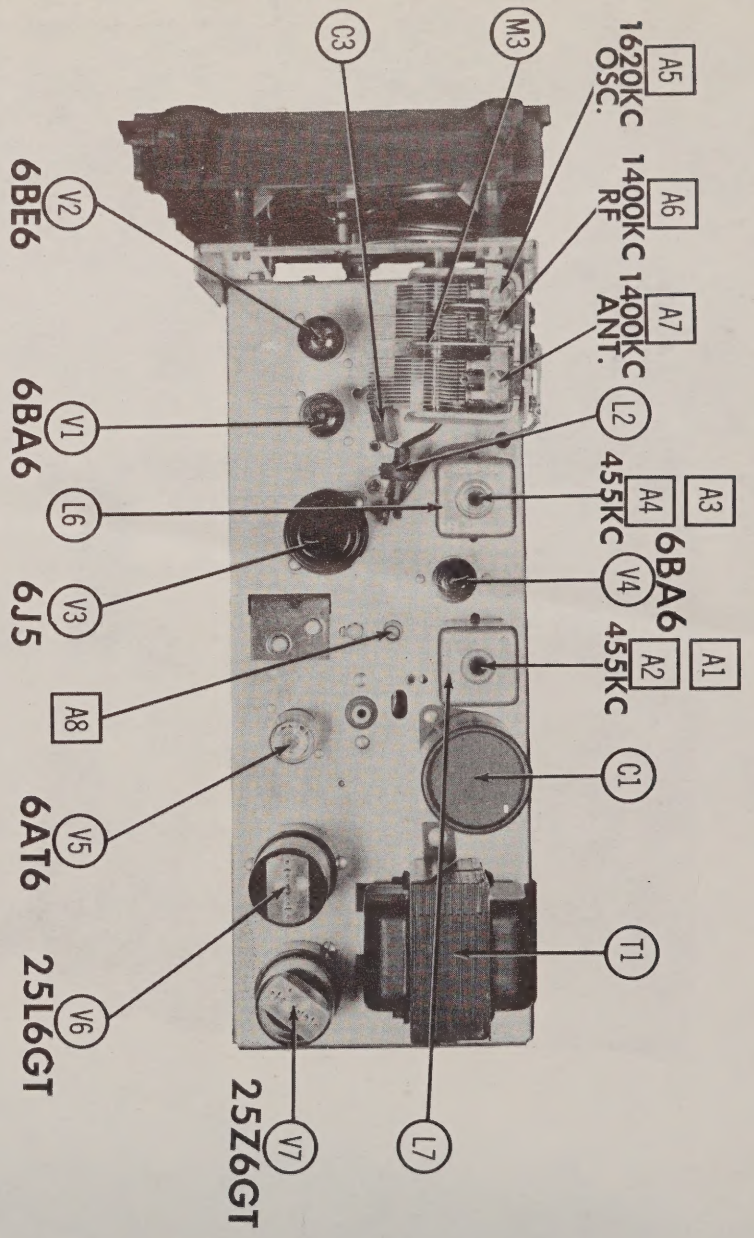
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R3	1 Meg	½	63-1912	BTS-1 Meg	
R4	330Ω	½	63-1765	BTS-330	
R5	10KΩ	½	63-1828	BTS-10K	
R6	1000Ω	½	63-1786	BTS-1000	
R7	22KΩ	½	63-1841	BTS-22K	
R8	2.2Meg	½	63-1926	BTS-2.2Meg	
R9	2.2Meg	½	63-1926	BTS-2.2Meg	
R10	1 Meg	½	63-1912	BTS-1 Meg	
R11	10 Meg	½	63-1954	BTS-10 Meg	
R12	4.7Meg	½	63-1840	BTS-4.7Meg	
R13	22KΩ	½	63-1841	BTS-22K	
R14	47KΩ	½	63-1856	BTS-47K	
R15	4.7Meg	½	63-1940	BTS-4.7Meg	
R16A	500KΩ	½	♦105-27		
B	500KΩ	½			

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R17	820Ω	½	63-1782	BTS-820	
R18	3300Ω	½	63-1806	BTS-3300	
R19	120Ω	1	63-1981	BTA-120	
R20	2200Ω	1	63-949	BTA-2200	
R21	2000Ω	5	63-3151	B3/4A-2000	
R22	47KΩ	½	63-1856	BTS-47K	
R23	4700Ω	½	63-1814	BTS-4700	
R24	15KΩ	½	63-1834	BTS-15K	
R25	68Ω	½	63-1737		

Items R16A, R16B, C14A, C14B, C14C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117. 3Ω Tap @ 82Ω 93Ω 98. 3Ω				95-1299				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	3.2KΩ	3.2Ω	270Ω	.69Ω	95-1300	A-3876 ①	A-2928 ①	RO-2 ①	S-1X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	VIKING PART No.	QUAM PART No.	
SP1	10"	PM	3.2Ω	49-723	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MERIT PART No.	
L1	Loop Ant.	.6Ω		S-18725		
L2	Ant. Loading Coil	3.6Ω		S-18685	TV-184	185Microhenries
L3	RF Coil	4Ω	11.5Ω	S-18683		Sec Tap. @ 5.3Ω
L4	Osc. Coil	.6Ω	9.5Ω	S-18682		
L5	Phono Osc Coil	2.1Ω		S-12603		
L6	Input IF	21Ω	21Ω	95-1101	BC-368	
L7	Output	17Ω	16Ω	95-1102	BC-376	

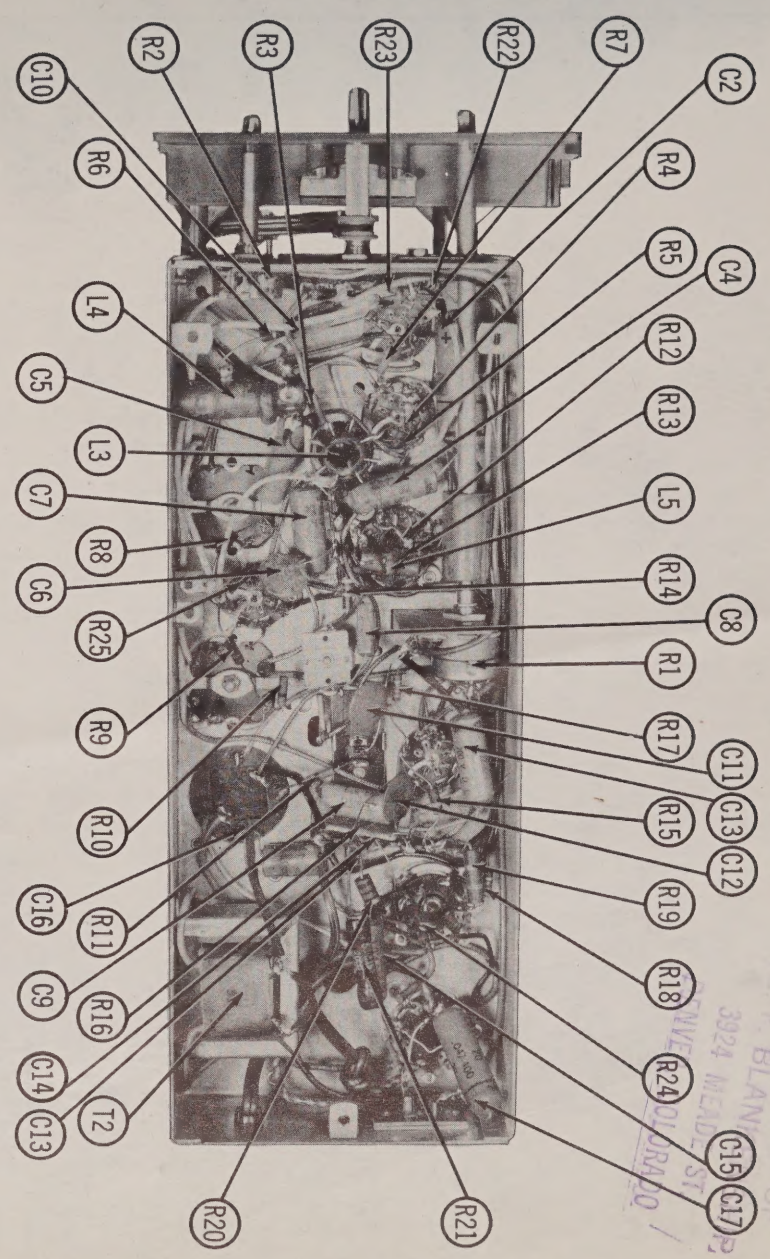
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	ZENITH PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	S-15780							Cobra Cartridges

MISCELLANEOUS

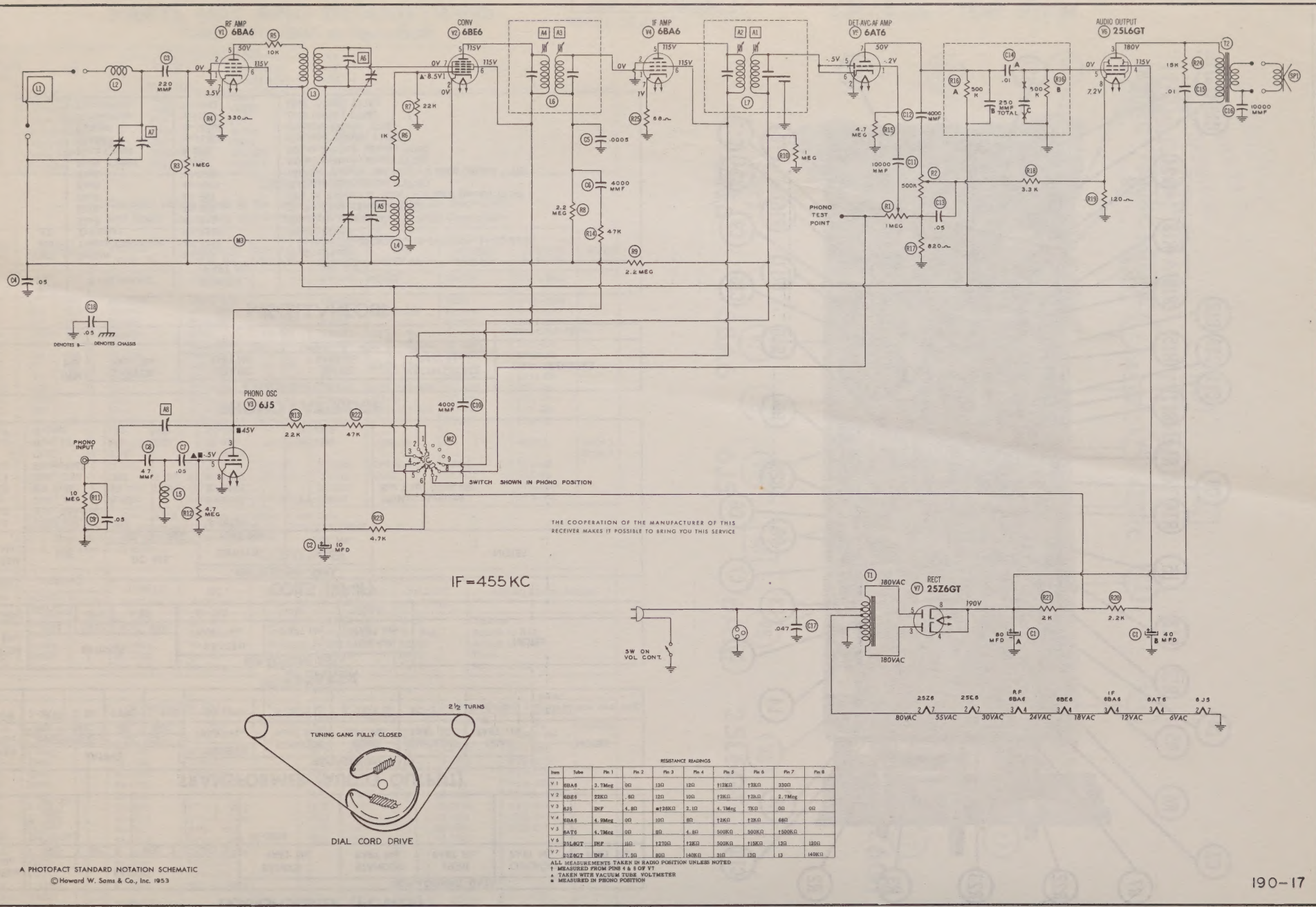
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Switch	85-519	Radio-Phono
M3	Tuning Capacitor	22-2392	3 Section (37-385MMF, 15-210MMF, 14-92MMF)
A8	Trimmer	22-2249	Phono Osc.
	Knob	46-945	Tuning (All Models)
	Knob	46-952	Radio-Phono(Model K777R)
	Knob	46-953	Off/On Volume & tone - 2 used (Model 777P)
	Knob	46-1009	Radio-Phono (Model K777E)
	Knob	46-1010	Off/On Volume and tone - 2 used (Model 777E)
	Back Cover	2-287	Phono Section (Model 777R)
	Back Cover	2-288	Phono Section (Model 777E)
	Cabinet	14-1450R	Console (Model 777R)
	Cabinet	14-1450E	Console (Model 777E)
	Escutcheon	57-1842	Dial (Model 777R)
	Escutcheon	57-1843	Dial (Model 777E)

CHASSIS—BOTTOM VIEW



PROPERTY OF
F. F. BLANCHARD
3924 MEADE ST.
DENVER, COLORADO

ZENITH
MODEL K777R (Ch. 7K20)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	3.7Meg	0Ω	13Ω	12Ω	†12KΩ	†2KΩ	330Ω	
V 2	6BE6	22KΩ	.6Ω	12Ω	10Ω	†2KΩ	†2KΩ	2.7Meg	
V 3	6J5	INF	4.8Ω	▪128KΩ	2.1Ω	4.7Meg	7KΩ	0Ω	0Ω
V 4	6BA6	4.9Meg	0Ω	10Ω	8Ω	†2KΩ	†2KΩ	68Ω	
V 5	6AT6	4.7Meg	0Ω	8Ω	4.8Ω	500KΩ	500KΩ	†500KΩ	
V 6	25L6GT	INF	1Ω	127Ω	†2KΩ	500KΩ	†15KΩ	13Ω	120Ω
V 7	25Z6GT	INF	7.5Ω	8Ω	140KΩ	3Ω	13Ω	13	140KΩ

ALL MEASUREMENTS TAKEN IN RADIO POSITION UNLESS NOTED
† MEASURED FROM PINS 4 & 5 OF V7
▲ TAKEN WITH VACUUM TUBE VOLTMETER
▪ MEASURED IN PHONO POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.